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Master and Servant

DISAGREEMENT sometimes arises between an employer and his employee in deciding the rightful ownership of an invention made by the employee using the employer's materials during working hours. A judgment of importance in this connection was given by Mr. Justice Farwell in the Chancery Division last week in *Triplex Safety Glass Co., Ltd., v. Scolah*. Mr. L. V. D. Scolah was employed by the plaintiff company as a chemist and during the course of his duties he discovered a method of making acrylic acid. This discovery was communicated to his employers, but no action was taken on their part until about two years later, just before Mr. Scolah left the service of the company. Having left the company he decided that the acid would be useful as an adhesive for his own business and accordingly applied for a patent. The company brought the action on the grounds that the invention was their property and the patent should accordingly be assigned to them. Mr. Justice Farwell held that it was a term of all employment that any discovery or invention made in the course of employment, during working hours and using the materials of the employer, was the property of the employer and not of the employee. He therefore made a declaration that the company was entitled to call upon the defendant to assign the patent.

It is generally considered that where, as in this case, the idea of an invention has not been suggested by the employer, the employee is entitled to apply for a patent. The employer may, however, have a right to have the patent assigned to him under an express or implied contract. For example, it was decided in *Mellor v. W. Beardmore and Co., Ltd.*, that the mere existence of a contract of service in no way disqualifies a servant from taking out a patent in his own name and entirely for his own benefit—and that notwithstanding that he has used his employer's time and materials to aid him in completing his invention—unless he has become bound by some agreement, either expressed or implied, to communicate the benefits of his invention to those in whose employment he is.

The matter seems to hang on what is meant by an "implied agreement"—in the last-mentioned case it was decided that an ordinary service contract was not such an agreement. It is clear that circumstances alter cases and that no clear-cut decision can possibly be made which will be equitable for all master and servant invention relationships. Thus it is simpler and more straightforward for both employer and employee to avoid the "implied agreement" situation as far as possible and to draw up a service contract containing a clause relating to the assignment of patents of inventions made by the employee during his employment. There is, of course, nothing new about these

clauses and most companies in the chemical industry have agreements with their employees regarding patent assignment, but the acrylic acid case is a reminder of the necessity of this for the satisfaction of both employer and employee alike.

The form which the agreement should take should be carefully decided. A bald statement that the servant must assign to his master the patents of all his inventions would not be admissible. A man employed in the chemical industry might make an invention totally unconnected with the industry. His employer having the above type of agreement could call upon his employee for assignment, but this action would certainly not be upheld in the civil courts. If an employee invented a device or process entirely outside the scope of his employer's business, and this invention was truly new, highly valuable and assured to bring a fortune to the owner of the patent protecting the invention, then, in such an event, the employer might very well argue that owing to the nature of the invention the employee must have, at any rate, perfected the discovery during his normal hours of employment even if he did not use the employer's materials also. The details of what promised to be a most valuable invention could obviously not be left to be worked out in leisure moments. Although a broad agreement assigning all the servant's inventions to the master would be too broad in scope to be held valid legally, the issue of an exceptional case, such as that outlined above, would be a nice point at law.

It is therefore necessary for the agreement to be limited to those inventions which deal with new products or new processes within the scope of the employer's own business. The majority of businesses in the chemical and allied industries have these patent agreements between employer and employee and they are most desirable in every case from every point of view. In America it is the law that an employee making a discovery, using his employer's materials and time, need not assign his patent to the company. The company is free to work the invention, but the employee may do so also on his own account. The company's working right is not exclusive. The view taken is that the employee by reason of his own matchless skill and ingenuity is entitled to something more than the normal salary of his employment. The British courts also take a sympathetic view of the employee's interests and, accordingly, any agreement between master and servant in this matter should make some provision for reward to the employee, for example, as a royalty, on assignment of his patent to the employer. The framing of these agreements should be studied carefully by both parties and legal advice obtained on points of doubtful issue.

Notes and Comments

Empire Trade Relationships

MR. J. W. BANFIELD, M.P., in a letter published on page 410, makes two suggestions designed to ease the wheels of commercial traffic between the Empire countries. At present relationships are such that, owing to favourable rates of exchange and the availability of cheap labour, a number of the countries are enabled to compete with the United Kingdom on an unfair basis. While tariff restrictions are imposed on foreign countries which have advantages of a similar nature, an almost free-for-all view is taken of trade within the Empire. Some plan of trade co-ordination is therefore desirable. Mr. Banfield suggests the establishment of an efficient liaison between the trading interests of the United Kingdom and the Empire and of manufacturing associations in all Empire countries for the purpose of investigating the situation, and exercising adjustment and control. The various manufacturers' associations, which have been set up in this country, have proved to be a most efficient method of dealing with trade problems to the satisfaction of the individual manufacturers concerned. The extension of this idea to include the Empire countries would not be an illogical step, and, if thus enlarged the organisation did not prove to be too bulky for active movement its efforts should prove to be equally valuable.

Cases of Injury by Drugs and Cosmetics

AFTER reviewing the state of national health during the past year, the annual report of the chief medical officer of the Ministry of Health, Sir Arthur MacNalty, directs attention to some instances where injury has been caused through misuse of chemicals. A warning is given that no slimming drug or preparation should ever be taken except on medical advice and one drug—dinitrophenol—should not be taken in any circumstances. While it is true that dinitrophenol is now covered by the new Poisons Rules and can only be obtained by medical prescription, untoward results have been only too frequent even when every care has been taken. Cosmetic preparations have sometimes been found to be a source of danger. In the case of lipstick, the dye was mostly at fault, and eosin was frequently found to be responsible. It is stated that hair dyes of vegetable origin would seem to be innocuous, but those which depend upon *p*-phenylenediamine or its derivatives might give rise to most severe dermatitis, with other developments, and fatalities had been recorded.

Balance Accuracy

THE balance maker has produced balances in great variety, with their own refinements apart from main variations in type. Accuracy, of course, is the first consideration, and it is to obtain this accuracy that particular refinements have been introduced. The selection of a balance is not just a simple matter of buying an instrument at a price which falls below a predecided figure. Perusal of one of the catalogues issued by a maker of chemical balances will soon show that. The introduction of the short beam was the first balance improvement and it had the advantage of giving a shorter period of swing and thereby increasing the speed of weighing. Possible loss of sensitivity which might have accompanied the use of a short beam was prevented by improving the suspensions, and it is here that the greatest utility of any improvements must be sought out when balances are inspected at the showrooms of the maker. Speed of weighing

is still further increased by damping the swings; oil, air, and magnetic damping has been introduced and advantages have been claimed for each method, but air damping is the most popular form. With an air damped balance, however, there is no rapid check of being able to see the balance swing freely on each side of its zero, and it therefore becomes necessary to test its accuracy at frequent intervals by weighing a known mass. For quick weighing there is the alternative of the chain balance, which is essentially an ordinary undamped balance with one end of a fine uniform chain attached to one side of the beam whilst the other end of the chain is attached to a vernier sliding up and down a vertical scale to indicate the proportion of the total weight of the chain which is being borne by the beam. A good balance of this type combines the advantages of rapidity with free swinging, but here again the need for accuracy demands that the weight of the chain be checked from time to time.

Argentine Chemical Trade

PROGRESS has been made by the U.S.A., Germany and Italy in their supplies to the Argentine during 1936, so that the United Kingdom share of the total imported goods has dropped correspondingly. In spite of this, however, the United Kingdom share in the business in chemicals remains at a satisfactory level and has even increased in some branches, according to a report on economic and commercial conditions in the Argentine Republic issued by H.M. Stationery Office. The most notable feature of the year in the heavy chemicals trade has been the extent to which Argentine industrialists working up national raw materials have taken advantage of their right to import, free of duty, the heavy chemicals they require. This country has retained its share of the alkali trade, but competition has brought prices down to a very low level. The imports of drugs have shown a definite improvement and the U.K. share has grown accordingly. Total imports of both patent medicines and of sheep and cattle dips declined slightly, but the U.K. participation remained much the same. The highly protective tariff supporting the local paint, enamel and varnish industry continues to make it exceedingly difficult for U.K. manufacturers to compete in price. It is remarked that the use of boiler chemicals for water softening on the private railways is declining, as water softening by base exchange has proved more efficacious and economical.

The Paris and Glasgow Exhibitions

IT is believed that the Government's principal reason in deciding not to participate in the Paris Exhibition when it is re-opened next Spring is the Empire Exhibition at Glasgow, which will open in Bellahouston Park next May. Whether the attendance at the Empire Exhibition will suffer as a consequence of the time extension of the Paris Exhibition is speculative. A correspondent to *The Times* believes that the situation will actually aid the success of the Glasgow show, as most of those who visit Paris will probably want to see what we can show in comparison. In any event, judging from the latest information published regarding the Empire Exhibition contained in a well-illustrated pamphlet just issued, arrangements are well advanced. Some interesting facts are given: The exhibition will cost, directly or indirectly, over £10,000,000, its minimum attendance should be 15,000,000 (20,000,000 is a more likely figure), it is backed with a guarantee fund of £700,000, and it will contain over 70 palaces and buildings.

The Properties of Chlorinated Rubber*

By

J. P. BAXTER and J. G. MOORE
(I.C.I. General Chemicals, Ltd.).

THE first important mention of chlorinated rubber is contained in a British patent taken out by Parks in 1846, which describes how the treatment of sheet rubber with gaseous chlorine improves the ageing resistance of the rubber. Later workers obtained patents for the chlorination of rubber in solution in carbon disulphide, benzene or chloroform. Gladstone and Hibbert in 1888 passed chlorine into rubber dissolved in chloroform, and finally isolated a product of approximate formula $C_{16}H_{13}Cl_7$. In 1890, Edison patented the use of halogenated rubber for insulating electrical condensers.

Industrial development of the product dates from 1915, when Peachey took out a patent for a process of chlorinating rubber dissolved in chloroform or carbon tetrachloride. In 1917, the United Alkali Co. (now part of Imperial Chemical Industries, Ltd.) began at their works at Widnes, the manufacture of "Duoprene," a chlorinated rubber marketed chiefly as a solution for direct application. Later patents specified the use of chlorinated rubber in moulded articles, and for varnishes, adhesives, and coatings for concrete.

Present Stage of Development

In 1934, Imperial Chemical Industries placed "Alloprene" on the market, and by 1935 five principal brands of chlorinated rubber were available—Alloprene (British), Tornesit (German and American), Tegofan (German), Pergut (German), and Detel (British). Three Japanese, one Italian and one other German firm are at present manufacturing chlorinated rubber, and recent patents have been taken out in Russia, France, Austria and Yugoslavia. Commercial development of the product was retarded by the high price of rubber until 1930, since when technical difficulties of production have been largely overcome, and chlorinated rubber of satisfactory stability, solubility, colour, viscosity and film-forming properties is now available.

Paint and Lacquer Industry

The product comes to the consumer as a cream-coloured powder, or as a floc-like material, of approximate formula $C_{16}H_{13}Cl_7$. It is prepared by the controlled chlorination of a suitable rubber solution. It has certain properties of outstanding importance to the paint and lacquer industry, in which the important factors are viscosity, strength, transparency and dielectric properties of film, and chemical and physical stability.

Viscosity, which controls both the formulation of the paint and its application by brush or spray gun, ranges from about fifty poises down to about half a poise in the marketed brands of chlorinated rubber when expressed in terms of a 40 per cent. solution in toluene. For "high solids" formulation of paints and lacquers, a viscosity of about three poises is recommended. Viscosity at any chlorine content is largely governed by manufacturing conditions, and can be controlled by mechanical treatment, heat treatment or U.V. radiation. Permanency of viscosity on storage has been shown to be excellent by storage tests on 20 per cent. solutions of Alloprene in xylene, butyl acetate, and Tetralin.

Film-forming Properties

Suitably plasticised, chlorinated rubber forms films of satisfactory transparency and tensile strength by evaporation from common solvents. With plasticisers used to the extent of 25 per cent. of the film, chlorinated rubber films of approximately

0.001 in. thickness showed tensile strength ranging from 3,700 lb./sq. in. with tricresyl phosphate as plasticiser, to 1,600 lb./sq. in. with amyl stearate. Tests of permittivity and power factor at a million cycles carried out on films containing varying percentages of plasticiser have shown that it is possible to prepare chlorinated rubber lacquers with excellent insulating properties, which, with their flame and chemical resistance, suggest many outlets in the electrical industry.

Transparency tests on films of chlorinated rubber one thousandth of an inch thick, and plasticised with dibutyl phthalate or with Cereclor, show that the absorption of visible light is practically negligible, being of the same order as that of Cellophane.

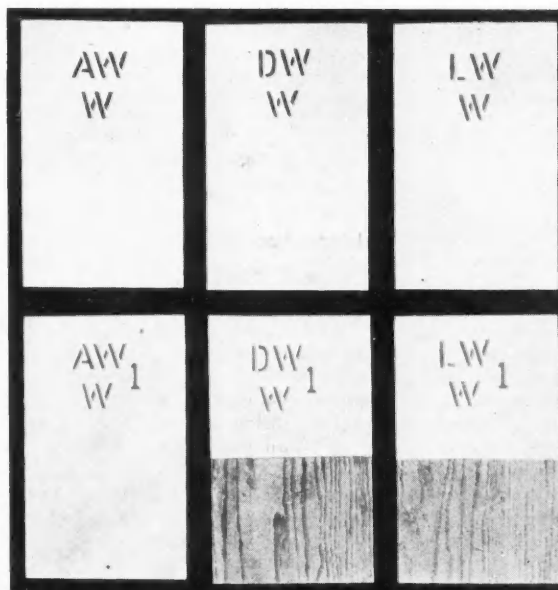
General Stability Data

Chlorinated rubber is on the whole a highly stable substance. It can, however, show three types of instability dependent upon (1) the presence of free HCl, trapped within the microstructure of the solid; (2) photo-chemical instability; and (3) thermal instability. These shrink to negligible proportions in a properly prepared product such as Alloprene. Chlorinated rubber correctly prepared is stable up to 100° C., and is not recommended for use in paints to be submitted to temperatures higher than that. Plasticisers require to be chosen with care, and Cereclor specially developed for this purpose meets most requirements.

Chlorinated rubber is notably flame resistant. At 230-300° C. in the absence of oxygen, it merely chars with copious evolution of HCl, which immediately smothers not only the chlorinated rubber, but also any surrounding conflagration. It is therefore of considerable value as a lacquer ingredient which at the same time is a fire extinguisher.

Chemical Resistance

Tests on the resistance of chlorinated rubber to hot and cold acids and alkalis have been carried out under paint conditions, *i.e.*, on the material in film form. Negligible changes



From left to right: Comparative resistance to sulphuric acid of Alloprene, resin and linseed oil paints on wood. Top: before immersion; bottom: after immersion.

* Abstract of a paper read before the Plastics Section of the Society of Chemical Industries on November 12.

in weight or tensile strength have been observed after immersion in acids and alkalies of varying strengths at 40° C. and under for periods up to 168 hours. Tests in which solid chlorinated rubber was immersed for several weeks at 40° C. in NaOH aq., HCl, nitric, acetic and formic acids, both strong and dilute, confirmed the tests on films. A very high resistance to attack by gaseous chlorine, ammonia, sulphur dioxide and hydrogen fluoride was also found.

Chlorinated Rubber Plastics

Chlorinated rubber in the unplasticised state can be moulded thermoplastically under a pressure of from 3-6 tons/sq. in., at 135-140° C. Rigid temperature control is necessary, and the

products are usually dark-brown and semi-translucent. Moulding temperature can be reduced by 15° C. by addition of 5-10 per cent. of plasticiser. Opaque mouldings have been obtained by the use of fillers and pigments.

Chlorinated rubber mouldings compare favourably with other moulded insulating materials in regard to dielectric properties. A range of interesting plastics is prepared from Allopren containing amounts of Cereclor and Seekay wax. Suggested uses for these chlorinated rubber plastic masses include tank linings and pipe jointing compounds, rubber plastics, non-inflammable dielectrics, sealing media, and as substitutes for linseed oil base in linoleum manufacture to improve flame-resistance in theatres, hotels, ships, etc.

Combustion of Coal

Chemical Treatments to Retard Rate of Burning

CHEMICAL mixtures designed for the treatment of coal, with a view to making the coal burn better, really have little effect on the combustion of the fuel. According to exhaustive tests which have been made at the United States Bureau of Mines. The results of these investigations are detailed in a bulletin which can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D.C., price 15 cents.

Patent records show that the idea that the burning of fuels can be improved by mixing or pretreating them with chemicals dates back to the early years of the last century. In the earlier years the amount of chemical recommended to be used was large, but from 1860 on it has ranged from 0.5 to 4 lb. per ton of coal. Until recent years the sale of such products was restricted to packages sold to householders under the general name of "fuel savers" with the statement that they would reduce the amount of coal used from 10 to 40 per cent.; during the last 10 years their use has extended to treating coal for large boilers.

As the result of inquiries received by the Bureau of Mines regarding the efficacy of these products, the subject was investigated for all chemicals known to have been marketed for this purpose, including water and chlorine. The chemicals were applied to a wide range of bituminous coals and to high-temperature and low-temperature cokes. The untreated and treated fuels were burned, under carefully controlled conditions, in overfeed and underfeed fuel beds at rates of burning varying from 1 to 50 lb. of fuel per square foot of grate per hour. Factors studied in detail were the effects of the chemicals on rates of ignition and combustion, on caking of coal in fuel beds, on tar and soot carried from the fuel beds, on soot deposited on surfaces of the furnaces and flues, on the emission of smoke, on the ash and clinker, and on the reaction of the sulphur in the fuels.

Valuable new methods of testing for the measurement and comparison of the burning characteristics of caking coals were developed and applied in the course of the investigation and are fully described in the present bulletin. Tests show that the possible fields of application of the pretreatment of fuels with any chemical are extremely limited. The effects of light treatments of the order of 4 lb. of chemical alone per ton of fuel, apart from the water that might accompany its use, were so small under any conditions of burning that they could not account for the improvement that users of treatments in this or smaller amounts have believed they observed in service.

Too much chemical applied to the surfaces of a fuel smothered it and hindered ignition and burning. The tests also showed that any changes that treatments can make in the burning of coal or coke decrease in magnitude as the rate of burning increases, and that differences are small at rates of burning higher than 10 to 15 lb. of coal per square foot of grate per hour, even with treatments as high as 40 lb. per ton of fuel.

Hydrogenation of Coal

New Method to be Operated in Germany

A PLANT which will make use of the new Pott Broche method for the hydrogenation of coal is now under construction in Germany. This system is intended to permit a better hydrogenation than is possible by the direct method. About 85 per cent. of the coal can be turned into a complex mixture of hydrocarbons with a mean molecular weight of about 1/40th that of the coal. This liquid is very good as a fuel for diesel engines, and can, if desired, be hydrogenated further for the production of petrol.

The method tends to eliminate the ash in the coal which is insoluble and cannot be hydrogenated. To accomplish this the coal is ground to fine grains of about 3 to 6 hundredths of an inch, and is then mixed with a solvent consisting of a mixture of phenols with tetrahydronaphthalene and in some cases with naphthalene. The best mixture has been found to be about 40 per cent. tetrahydronaphthalene, 40 per cent. naphthalene and 20 per cent. phenols. This mixture is then carefully heated, care being taken not to heat too much for fear of forming a coke. The disintegration of the coal begins at about 300° C. and is completed at 400° C. The liquid can then be drawn off and the solvent eliminated. The remaining substance has the appearance of tar; it cannot be conveniently vaporised, and its hydrogenation must, therefore, begin with a liquid phase as in the hydrogenation of coal.

"Dustproof" Coal

Exhibits by Fuel Research Station

EXHIBITS which illustrate research carried out at the Fuel Research Station are being shown at the Engineering Exhibition, which opened at Cardiff on November 17.

The exhibits deal with aspects of the coal survey and also the dust-proofing of coal. One of the disadvantages associated with the use of coal in certain circumstances is the dust created in handling. Work in America has indicated that this disadvantage of dust can be overcome by spraying the coal before use with a small quantity of a non-drying liquid such as oil, calcium chloride solution or an oil-water emulsion. The application of this process to British coals is being worked out at the Fuel Research Station. The quantity of oil required, for instance, to dust-proof a slack coal completely, varies from about 5 to 20 lb. per ton according to the rank of the coal—being lowest in the case of anthracite. Special oils of the spindle type are ideal for use, though fuel oils may be used. This treatment is particularly favourable for coal for domestic use. Treated coal can be tipped into bunkers or cellars and shovelled about without raising any dust at all. Owing to the small quantity of oil required the cost of the process is but little and should not exceed sixpence per ton.

Copper in the Construction of Chemical Plant

By

DR. ALFRED SALMONY

IN spite of the fact that during the last few decades numerous metallurgical products have been discovered or developed for the construction of chemical plant and pipe lines, such as special alloy steels and light metal alloys of pronounced corrosion resistance, experience has shown that copper is an indispensable material of construction. There can be no doubt that there is no better material than copper for high pressures (especially high pressure pipe lines of 200 atm. and over), air liquefaction plant, autoclaves, vulcanising kettles, etc. Copper also remains unexcelled for oil baths, small heatable apparatus with stirrers, etc., due to its exceptionally high thermal conductivity which is over six times that of iron.

The excellent heat conducting property of copper is important wherever rapid heating and cooling is very desirable, for instance in refrigerators, heat exchangers, and in the manufacture of Turkey-red oil and similar preparations. Copper is much more easily worked than other industrial metals. On account of its pronounced corrosion resistance its durability is very great, and its scrap value is very higher in proportion to its prime value. It is a perfect construction material because of its ability to permit sudden temperature changes, as in the case of the stand oil boiling of Chinese wood oil with the aid of the modern eddy-current system of heating kettles of large capacities.

Heat Transmission Qualities

It has been known for a long time that copper is unexcelled as a material of construction for pipes used for the transmission of cold and hot water. Bright drawn copper surfaces are quickly covered with a thin but dense and adherent coat of cuprous copper which is not redissolved even by water containing corrosive substances. Copper also forms a suitable material for the transmission of volatile solvents. Many chemical works require a central hot water supply using water of doubtful purity containing dissolved or undissolved impurities, such as rust particles, and this is possible only if the boiler and the feed and service pipes are made of copper. Heating coils for the production of pure distilled water were once made exclusively of tin. Such coils were expensive, but they can now be replaced by copper coils plated with a non-porous layer of tin. In an instructive paper, M. Cymboliste¹, has discussed the conditions under which electrolytic and dip plating of tin can be obtained in a most satisfactory manner. A simple and reliable method of testing tinplate has been developed by Dr. H. Serger and G. Lüchow².

The fixing of copper pipes and fittings can be effected by an expert plumber just as easily as for iron pipes. Up to diameters of about 1½ in. the copper pipes can be bent cold to short radii without filling material; the bending of larger pipes is effected with ease after filling them with fine dry sand, heating to a red heat in a charcoal fire and chilling the bend with cold water.

Copper pipes of large cross section, as well as copper cylinders used in the construction of kettles, boilers and containers exposed to heavy stresses, are best produced by modern centrifugal casting processes. In these processes the fluid metal is conducted into rapidly rotating chill moulds or special sand moulds under definite conditions adapted to the purposes in question, and then solidifies under the influence of centrifugal force, so that the grain becomes exceedingly fine and dense while slag inclusions and gases are pressed out of the metal. The castings thus produced are characterised by particular strength and by a dense and homogeneous structure.

The development of copper alloys suited to chemical purposes has been most prolific during the last few years. High strength copper alloys containing silicon and manganese are

employed to an increasing extent in the construction of hot water tanks, boilers, etc. In a paper offered at the occasion of the Metal Meeting at Aix le Chapelle, 1937, Dr. K. Kaiser recommended a copper alloy for water heating apparatus containing 2.2 per cent. of manganese and 0.8 per cent. of silicon. The attention which is now being paid to the subject of the copper alloys was also emphasised by W. O. Alexander and Professor Hanson at the 1937 autumn meeting of the Institute of Metals. M. Mengerlinghausen³ investigated a number of high strength alloys such as "Sicufal," "Werkstoff 132" and "Werkstoff 240" (recently named "Sicudur") and the ageable alloy "Mandura." There are a number of other standard high strength alloys, such as "Kuprodur." The American alloy, "Everdur," has been employed in the construction of large tanks for the American brewing industry.

It is frequently necessary in the construction of chemical plant to have alloys of exceptional corrosion resistance. One of these alloys is the special bronze "DKS" developed in Germany, the corrosion resistance of which is claimed to be due to the fact that the copper-silicon mixed crystal in it is in the single-phase range.⁴

Methods for working copper and its alloys have been developed considerably. Much attention has been paid to welding, especially electric welding with the aid of the modern lattice-controlled seam and spot welding machines, which has made satisfactory welding possible for heavier copper plates. Faultless welding, which previously was practically impossible, prevents corrosion due to the formation of local elements as well as the so-called "contact corrosion" investigated by Carius⁵. The latter type of corrosion is particularly evident in connection with rivet connection, and the possibility of replacing riveting processes in the construction of copper plant with modern welding methods therefore shows considerable advantage. Faults due to workmanship are uncommon in the construction of copper plant.

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³ M. Mengerlinghausen, "High-Strength Copper Plates," *Heimische Werkstoffe für Warmwasserbereiter*, VDI-Verlag, Berlin (1937).

⁴ "Corrosion-Resisting Bronzes," *Mitteilungen aus der Metallgiesserei der Demag. Demag Nachrichten*, 1937, 1, 5.

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South African Salt

Triple Effect Evaporators Recommended

ALARGE quantity of the best salt sold in South Africa is imported, but there are still keen attempts to improve the quality of the local product and make it suitable for general use. The Board of Trade and Industries has again recommended that the producers should use triple effect vacuum pans to obtain the best results in the refining operations. It has been shown that in this way under South African conditions a high quality salt can be obtained, although the initial outlay is so heavy that only the more important salt producers could adopt the suggestion. A few of these producers are introducing modern methods to overcome the formation of scale and improved provision of running water. The usual South African method is that of evaporating the brine at a reduced pressure, and by using the steam from the first pan successively in the other two superior results would be obtained.

Letter to the Editor

Empire Trade Liaison

SIR,—I should like to make two suggestions aimed at avoiding any possible misunderstanding arising from the haphazard commercial relations between the countries of the Empire.

Firstly, could not a system of efficient liaison between the trading interests of the United Kingdom and the Empire be established? Secondly, could not manufacturing associations in all Empire countries organise a clearing house to review the present situation and to provide for that equitable adjustment and control which would make for agreement in the future? A good deal of unnecessary overlapping and confusion exists to-day, simply because there is, in the field of trade, no planned co-ordination between the Empire countries.

Australia, for example, as a result of an exchange advantage, is able to compete unfairly with the United Kingdom manufacturer in his own market, notably in the case of woollen hose. Hong Kong and Indian manufacturers, with wage and working conditions comparable to those of Japan, can also undermine the United Kingdom market. Where will this end? Under to-day's conditions, surplus manufacturing capacity will increase. If the United Kingdom is to become the happy trading ground of the Empire countries, then it must look forward to redundant factories, wage-cutting, a lower standard of living, and greater unemployment.

Nothing but waste and confusion would arise if two or three great United Kingdom companies, all manufacturing the same article, decided without reference to zones of trading to set up factories abroad. They would also, if they were wise, appoint a liaison officer who would exercise such a control that, whilst the individual companies concerned competed in efficiency, they would not embark on that free competition in all markets, the result of which was bound to be, first, cost reduction and, next, lower wage rates and a corresponding loss of purchasing power.

The time to act is now. A friendly and intelligent review of Empire trading relations will remove the possibility of any quarrel in the future when manufacturers of Empire countries will have much more to lose than they have now as the result of a system the foundation of which is unsound.

—Yours faithfully,

J. W. BANGFIELD, M.P.

House of Commons.

British Association of Chemists

Continued Progress of the Scottish Section

AN enjoyable dinner and smoker was held recently by the Scottish section of the British Association of Chemists at the George Hotel, Buchanan Street, Glasgow. Mr. Dudman, chairman of the section, presided.

In extending a welcome to members and their friends, Mr. Dudman expressed the president's disappointment at his enforced absence. He was glad to report that the association continues to make progress. The fact that this progress is slow is because it is generally dependent on a small body of very enthusiastic members. The work of the association, he said, is such that it should call forth equal enthusiasm from all members. The individual can only benefit by his membership to the extent of the work that he puts in on behalf of the association; even passive support is useful because this means financial support, but it is far more valuable where the member can approach his colleagues with enthusiasm and persuade them to work with him in increasing and extending activities.

Telegrams were received from the president and general secretary, stating that while they were unable to be present they wished the Scottish section every success.

Indian Molasses

Research at Indian Institute of Science

A REPORT prepared by the Indian Institute of Science, Bangalore, for the use of the Indian Sugar Tariff Board, gives a short account of the past five years' research on the utilisation of cane molasses in the bio-chemistry department of the Institute. It has been found that molasses can be decomposed outside the field and in the absence of air, yielding certain salts which can be directly utilised by soil bacteria in nitrogen fixation. The quantity of nitrogen thus added to the soil is about three times what may be expected from direct application.

A new process has recently been developed for the conversion of molasses into a dry product, which will not moisture and can stand transport over long distances. This product is a good fertiliser and is much more efficient in its action than the original molasses, its nitrogen-fixing capacity being very high. If mixed with water, the product turns to a plastic mass which can be utilised in the manufacture of various articles and also for road surfacing.

In the research connected with the preparation of edible sugar syrup, it has been shown that bitter salts associated with molasses can be largely removed by electro-dialysis. The resulting sugar solution is comparatively dilute. The salts can also be preferentially removed by certain substances like charcoal, but the removal is not complete. Potash, which is the chief soluble salt in molasses, can be separated by chemical precipitation. A simple method involving the use of some cheap natural products has been developed for the purpose. The resulting sugar syrup is sweeter than the original product. The potash salt can be utilised for a variety of purposes including application to land as fertiliser.

It has also been demonstrated that cane molasses can be converted into yeast after the addition of suitable amounts of nitrogenous substances and small quantities of mineral nutrients. Practically no alcohol is formed during the process, which involves vigorous aeration. The yeast can be separated by centrifuging. The yield is about 30 to 40 per cent. of the theoretical; the remaining part is either lost as gas or converted into acid products.

Vitreous Enamelled Goods

Use of New Trade Sign by Makers

THE Institute of Vitreous Enamellers have sent a circular letter to members of the Vitreous Enamelling Trade pointing out that the "trade sign" allowed by the Board of Trade is now registered under the Trade Marks Acts, 1905-19.

Every applicant for the issue of a certificate for the use of the trade mark must prove to the satisfaction of the Council of the Institute that the goods in respect of which he applies for the issue of the certificate are metallic articles or other metallic goods that have all been fashioned in the United Kingdom before enamelling, from metal cast, rolled, stamped or spun in the United Kingdom and which have been finished in the United Kingdom with vitreous porcelain enamel fused, alloyed or fluxed within temperatures of 600 to 1,000° C. For the use of the trade mark no fees will be payable by members of the Institute, but non-members will pay £5 5s. per year.

The purpose of the trade sign is to enable the general public, when purchasing vitreous enamelled goods, readily to distinguish between the genuine vitreous enamelled product and such other finishes as stoved synthetic paints, etc. As the trade sign has full Government recognition and support, its application to genuine vitreous enamelled goods is in fact what the hall-mark is to sterling silver. It will now be an offence in law to affix a trade sign to any vitreous enamelled ware other than that which complies with the standards required by the Government. Thus the granting of this trade sign makes it possible for the purchaser to distinguish genuine vitreous enamelled goods.

A Laboratory Gas-Washing or Absorption Unit*

By

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THE absorbing unit described herein was developed in this laboratory for complete absorption of various gases or vapours by volatile solvents. The literature contains many references to gas-absorption vessels, such as those described by Milligan (1), Martin (2), Shaw (3), and Martin and Green (4), which seem to be satisfactory for general laboratory use. However, it is believed that the apparatus illustrated in this article has certain advantageous features not found in the units mentioned above.

This apparatus, about 45 cm. (18 in.) high from the fritted-glass diffusing plate to the top of the spiral, gives a path of travel of about 225 to 250 cm. (90 to 100 in.), compared with approximately 175 cm. (70 in.) in the Martin unit, 100 to 112 cm. (40 to 45 in.) in Milligan gas-washing bottles, and considerably less in other types. The side leakage which is found in Milligan bottles, particularly when the spiral and sleeve do not fit perfectly, and the channeling characteristic of packed bead columns, especially at low rates of gas flow, are avoided in this equipment.

The jacket around the spiral makes it possible to minimise the loss of a volatile absorbing medium by circulating cooling water or brine around the spiral, or to maintain the system at a temperature above that of the atmosphere. This method is more satisfactory than the regulation of temperature by putting an absorption bottle in a bath, both for economy of space and freedom of movement and manipulation. Further, the jacket gives the unit structural stability and ease of support not possessed by the Martin apparatus.

Construction

The unit was made by sealing a porous fritted-glass diffusing plate, *A*, to the delivery end of a 37.5 cm. (15 in.) Graham spiral condenser (made by the Scientific Glass Apparatus Co., Bloomfield, N. J., to the authors' specifications). The sintered plate was similar to Jena plates of porosity 1 (coarse). A side-arm test tube, *B*, was fitted to the delivery tube by a ground-glass joint. The clearance between the fritted-glass plate and the bottom of the reservoir, which had a capacity of about 50 to 60 ml., should be 1 cm. or less. The removable head, *C*, with a sealed-in outlet tube, was connected by a ground joint and fitted with a stopper. The tubing used throughout was 8 to 9 mm., inside diameter. A similar, smaller unit, having 5 to 6 mm. tubing and a 25 to 30 ml. reservoir, also gave satisfactory service, though the capacity and rate of flow were somewhat lower.

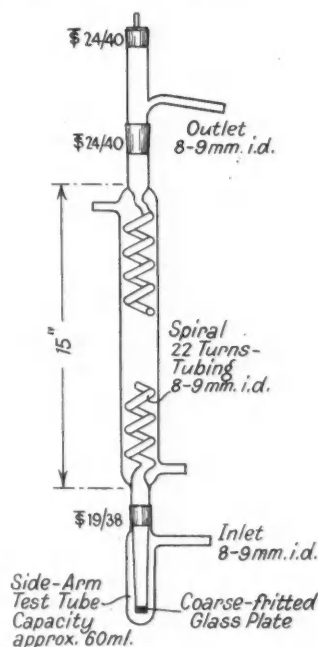
It is necessary to match the reservoir capacity to the diameter of tubing used. The volume of liquid between points *A* and *B* should be almost sufficient to fill the internal spiral. In this way, by varying the height to which the reservoir is filled, before the passage of the gas to be washed, it is possible to regulate the height to which the liquid will be forced. Thus the effective path of the gas through the absorbing medium may be set anywhere between 12.5 and 250 cm. (5 and 100 in.).

Operation

Sufficient solvent is added to fill the reservoir at the bottom to just below the side-arm inlet tube, *B*. Suction is applied to the outlet tube, *C*, in the head (or positive pressure on the inlet side). The liquid is forced up into the spiral, and the gas, broken into small bubbles by the fritted-glass plate, *A*, travels up through the solvent. The liquid is carried up to some extent, but descends by gravity, resulting in constant mixing of the absorbing medium and washing of the walls of the spiral. If the solvent is definitely volatile, loss may be

largely prevented by passing cooling water or brine through the jacket, the level of liquid being adjusted to give sufficient condensing surface on the upper portion of the spiral.

The efficiency and operating characteristics were determined in a series of simple tests, similar to those employed by Shaw (5). The rate of which a gas may be passed is dependent upon the character of the absorbing medium, being influenced by the gravity, viscosity, and surface tension. A rate of approximately 80 litres per hour has been found to be the maximum possible. With water as the liquid absorbent a rate greater than 60 litres per hour had a tendency to carry the liquid up out of the spiral into the head. The head is of sufficient volume so that no liquid is carried over, but absorption at these extreme rates becomes inefficient.



This rate (maximum 60 to 80 litres per hour) is not as high as the maximum possible with a Milligan bottle. However, two Milligan bottles were tested and it was found that one showed considerable side leakage. This first became appreciable at a rate of 10 litres per hour and it was estimated that at 20 litres per hour more than 50 per cent. of the gas was not following the spiral, but was passing vertically through the liquid between the spiral and the sleeve. The other Milligan bottle performed well up to 60 litres per hour, and by-passing first became significant at this rate.

The time of contact in a well-matched Milligan bottle at a rate of 60 litres per hour is roughly 0.7 second, whereas the time of passage through the absorber described herein is about 5 to 6 seconds at that rate.

Carbon dioxide solutions in air were passed through potassium hydroxide solutions (approximately 0.5 *N*) at varying rates and the gas stream was then checked by means of the method of Higgins and Marriott (1) and found free of carbon dioxide.

Air containing 8 to 10 per cent. of ammonia was passed through the unit which had been charged with 50 ml. of 0.1 *N* sulphuric acid to which a few drops of methyl orange had been added. A trap containing 2 drops of 0.1 *N* sulphuric acid in water coloured with methyl orange was connected to

* Industrial and Engineering Chemistry (Analytical Edition).

the outlet. The rate of flow was 60 litres per hour. Flow was maintained for 60 seconds and the absorbing liquid was washed out of the unit by adding several small portions of water through the opening in the head. The solution was then titrated to the neutral point with 0.35 ml. of 0.1 *N* sodium hydroxide. The colour of the solution in the trap had not changed and 2 drops of 0.1 *N* sodium hydroxide were required for neutralisation.

In a second similar test, with the same setup except that the trap contained 5.00 ml. of 0.1 *N* sulphuric acid, the ammonia-air solution was passed through until the absorbing solution had just passed the neutral point. Titration of the acid in the trap showed that only 0.12 ml. of the acid in the trap had been consumed.

The apparatus has also been found to give satisfactory re-

sults in the absorption of unsaturated hydrocarbons in liquid bromine, as well as in bromine solutions in petroleum ether, carbon tetrachloride, and potassium bromide-water solution.

The volume of absorbing liquid is small, only 20 to 50 ml. being required, and the absorbing medium or any soluble or liquid products of absorption may be quantitatively recovered by rinsing the spiral from the top with a small amount of wash liquid.

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Ethylene and Propylene

Heats of Combustion

ETHYLENE and propylene are two hydrocarbon gases which have become very important within recent years, because of their availability (of the order of 100,000,000,000 cubic feet annually) as by-products from the "cracking" process of the petroleum industry, because of their use in the synthetic production of alcohols and other chemical substances, and because of their utility in the making of motor fuel of high anti-knock value by the newly-developed polymerisation process.

If such processes are to be carried on most economically and profitably, there must be known accurate values for the heats and free energies of formation of these substances. Notwithstanding the importance of ethylene and propylene in these industrial processes, their existing values of heats of formation depend upon measurements made about half a century ago. Because data obtained at the National Bureau of Standard, in the United States, several years ago showed that the old "accepted" value for the heat of combustion of ethane was in error by about 4 kg. calories per mol, it was suspected that the old "accepted" values for ethylene and propylene might also be seriously in error. A redetermination of these two important thermodynamic constants is reported in the *Journal of Research* for September.

The results of these new measurements show, for ethylene, a discrepancy even more startling than that previously found for ethane. The new value for ethylene differs by about 5 kg. calories per mole from the old "accepted" value, and the new value for propylene differs by about 2 kg. calories per mole from its old "accepted" value. In terms of the heat evolved in the combustion of the gas in oxygen to form gaseous carbon dioxide and liquid water, all at 25° C. and a constant pressure of 1 atmosphere, the new values are: ethylene, 337.28 ± 0.07 kg. calories per gram-mol; propylene, 491.82 ± 0.15 kg. calories per gram-mol.

Tomato Seed Oil

Utilisation in Italy

EXPERIMENTS in the use of tomato seed oil as a substitute for linseed oil are being carried out in Italy.

The oil obtained is semi-siccative and is giving very satisfactory results for paint. The mixture being used is one of 30 per cent. tomato seed oil, with 70 per cent. linseed oil. The economy of the system is ensured by the enormous quantity of tomato seeds available from the canning industry. The grain when pressed fresh gives about 28 to 29 per cent. of oil with 7.5 per cent. of water. When the dried seeds are pressed they give 26.3 per cent. oil, 30.35 per cent. protein, and 5.5 per cent. ash. The oil has a composition of 45 per cent. olein, 34.2 per cent. linolein, 12.47 per cent. palmitin, 5.89 per cent. stearin and 2.44 per cent. of unsaponifiables.

Tar Distillation in Canada

Production Statistics for 1936

TEN coal tar distillation plants were in operation in Canada during the year 1936, the value of production being estimated at \$2,942,255, as compared with \$2,606,338 in 1935. Capital investment totalled \$4,507,819, whilst 216 persons were employed, earning \$287,819 during the year.

The quantity of crude tar used for distilling was 22,361,619 imperial gallons, costing \$1,278,283, whilst the main products were creosote oils, pitch, refined tar, tar felts and sheathings and protective paints, cements and other specialties. Certain tar derivatives such as phenol, cresylic acid, etc., were made in the Toronto plant of the Dominion Tar and Chemical Co., Ltd. Imports during the year included 1,919,125 Imperial gallons of crude coal tar valued at \$115,507; 69,561 cwt. of coal pitch (\$46,553); and 373,916 gallons (\$55,339) of carbolic or heavy oil. Exports included 3,032,501 gallons of coal tar and pitch valued at \$155,870; 186,420 gallons (\$34,069) of creosote oil; and 4,541,700 gallons (\$527,518) of other coal tar oils.

Phosphorus Plant Achievement

Award to Monsanto Chemical Co.

THE 1937 award for chemical engineering achievement, which was instituted by *Chemical and Metallurgical Engineering* in 1933, has been awarded to the Monsanto Chemical Co. for having contributed most to the advance of the chemical industry and of the chemical engineering profession during the past year. The award was based primarily on the design, construction and operation of a new phosphorus producing plant, built this year near Columbia, Tenn. Within a period of 15 months the company converted an expanse of pasture land into an efficient chemical plant, making it the nation's largest producer of phosphorus. By means of radical improvements in the design of electric furnaces and of auxiliary equipment, it is now possible to convert low-grade phosphate rock directly into pure phosphorus in large tonnage. The new plant uses as much power in its operation as is required by the entire city of Memphis.

White Arsenic Production in Rhodesia

THE production of white arsenic has been started in Southern Rhodesia at the Hydra mine, 20 miles west of Gwanda, near the Tuli river. At present the plant consists of a two-stamp gravity mill for gold recovery, the arsenic being produced as a by-product. Some years ago the arsenic produced at the Hydra mine supplied almost the whole of the South African market. It is now stated that the mine is equipped to supply the entire South African market at or under a competitive price with the overseas product.

New Ways of Delustring with Tin Salts

Simple and Reliable Process for Piece Goods

IT is now quite possible that, owing to recent technical advances, manufacturers will revive the use of ordinary bright yarns for rayon fabrics, depending on the finisher to process the goods afterwards to the exact degree of dullness required. This was the original method of delustring and is largely used for some classes of goods to-day, but the advent of yarns delustred during extrusion by the incorporation in the raw viscose of an insoluble pigment such as titanium dioxide caused it to be superseded owing to the superiority of the effect obtained by the latter method.

Disadvantages of Ready-Delustred Yarns

There are numerous disadvantages in the use of ready delustred yarns, however, chief of which is the wear and tear on machinery parts such as thread guides, needles and sinkers. It has, therefore, been the aim of a number of concerns to evolve a process whereby woven or knitted fabrics could be delustred in the piece in such a way that a pigment is not simply precipitated on the fibre but is enabled to penetrate within it. According to results obtained with certain tin salts recently, it would appear that textile chemists are at last working on the right lines.

The latest methods of piece-delustring are based on the affinity of cellulosic fibres for alkalies and their capacity for absorbing and retaining alkaline solutions. If a viscose rayon fabric, consequently, is run through a bath of 2 per cent. caustic soda, all excess liquor can be subsequently freed from the fabric by simple rinsing in water, after which the material will still be found to contain an appreciable amount of alkali uniformly absorbed. It is this *retention* of liquor in a *uniform* manner, without resort to such operations as padding, which will recommend the newer methods to finishers.

In practice, viscose rayon goods are treated in a solution of sodium stannate containing 0.5 per cent. stannic oxide for half-an-hour at a uniform temperature. This solution is so strongly absorbed by the rayon that the superfluous liquor can be dispelled by simple rinsing of the goods, without removing the tin absorbed by the fibres. If, in place of water, a solution containing calcium salts is used, insoluble calcium stannate will be formed. For this reason it is possible to get delustred effects by washing the rayon in *hard* water.

A "One-Bath" Process

Delustring can also be achieved by this process in other ways. As is known, barium stannate is insoluble in water, while barium hydroxide, being alkaline, is strongly absorbed. After a preliminary treatment with barium hydroxide, therefore, the excess solution is removed by rinsing with water, after which the goods are treated with sodium stannate solution so as to form in the fibre barium stannate, also give the fabric a delustred finish which is not removed by washing. According to one recipe the rayon is treated with a 0.1 per cent. solution of barium hydroxide at 20° to 30° C. for half-an-hour, after which it is rinsed in cold water and then treated in a bath of 0.5 per cent. sodium stannate solution. During this operation the temperature is gradually raised to 60° C., after which the goods are dried.

Instead of barium hydroxide, calcium hydroxide can be used although on account of its greater alkalinity the former is preferred. There is, however, a further difference between these two solutions for delustring, for whereas barium hydroxide is soluble up to 4 per cent., calcium hydroxide is soluble only up to 0.75 per cent. Good delustred effects have been obtained by using barium hydroxide in a 1 per cent. solution. A one-bath process has also been worked out which has points of interest. The bath is made up of 1 part barium

hydroxide, 3 parts sodium stannate and 5 parts sugar, all finely ground up and dissolved in water. The goods are treated in this solution for 20 to 30 minutes at 50° to 60° C. After this they are rinsed, centrifuged and dried. The process is said to give a very satisfactory and uniform delustred effect.

These processes, which are covered by British patents, are equally applicable to fabrics composed of or containing bright viscose staple fibre.

Polymerisation of Rubber Latex

Effect of Quinones and Related Compounds

QUINONES and related compounds have been found to enhance the polymerisation, and, under certain circumstances, the depolymerisation, of rubber latex, according to Spence and Ferry (*J.A.C.S.*, 1937, 59, 1,648-1,653).

Hevea latex of 5 per cent. rubber content, maintained with dilute phosphate buffers at a pH of 6.8-7.1, was treated with the various quinones, both in the presence and absence of air, and in light and dark. It was then coagulated, acetone extracted, and a measure of its degree of polymerisation obtained from the proportion soluble in benzene in 14 days. Polymerisation was increased by *p*-benzoquinone, in the absence of air, and to a certain, but much smaller extent, in its presence.

The effect was greater in the light than in the dark, showing that the reaction which took place between the rubber and the quinones was a photochemical one; irradiation at the moment of reaction was shown to be necessary by the fact that latex and quinone, separately irradiated before mixing them in the dark, gave a product of no higher state of polymerisation than that produced by the reaction in the dark without any pre-irradiation. The aqueous phase of the latex had no connection with the reaction—equally enhanced polymerisation was obtained with coagulated rubber, made into thin sheets and exposed to the vapour of quinone until it had increased in weight by 1 per cent. However, with benzene solutions of rubber, the compounds had only a depolymerising action.

Increased polymerisation in the presence and absence of air was similarly caused by 1:1 and 1:4 naphthaquinones, tolu-*p*-quinone, chloranil, and benzophenone, whilst phenanthrenequinone and benzaldehyde caused depolymerisation in the presence of air, and polymerisation in its absence.

The explanation of the effect offered is that two concurrent reactions occur between rubber and these compounds, one leading to the formation of an intermediate compound which polymerises easily, probably by the condensation of quinone, etc., molecules on the ends of rubber macro-molecules, so that the small molecules act as links between the larger ones, whilst the other reaction involves the formation of a different type of intermediate compound, which lays the rubber molecule open to attack by molecular oxygen. The depolymerisation in benzene solution could then be explained as being due to frequent deactivation of the polymerising intermediate compound, due to the dilution, before polymerisation could occur, giving the depolymerising reaction a chance to get ahead.

It is suggested that the function of sulphur in vulcanisation may be the formation of some compound with the accelerator, which compound then produces polymerisation in the same way as the quinones, etc.

A SUBSTANTIAL increase in the French output of arsenic acid is forecast for the next few months. The Salsigne Mines (Aude) has doubled the capacity of its plant for recovering arsenic from flue gases, while a similar plant is under construction by the Villanière Mines.

Dispersions of Colloidal Carbon

Alteration of pH Due to Adsorption Effects

AN investigation of the cause of the alteration of the pH of distilled water in which colloidal carbon has been dispersed, has been made by Wiegand (*J. Inst. Pet. Technology*, 1937, 2, 281-284). The pH of aqueous extracts of various carbons lie in the range 2.6-5.7 for impingement specimens, 3.1-4.2 for lampblacks, and 8.2-9.2 for non-impingement varieties made by thermal decomposition.

It was found that the values were unchanged by repeated extraction with boiling distilled water or organic solvents. The water-soluble acid content in no case exceeded 0.01 per cent. calculated as H_2SO_4 . When immersed in solutions of neutral salts, very much larger changes were produced than in distilled water. A definite inverse proportionality between the volatile content and the pH was found, the former rising to 9-10 when the volatile content approached zero. This result, derived from the examination of a number of carbons, was found also to hold during the gradual elimination of the volatile content of a single sample, by furnacing at increasing temperatures.

It is concluded that low pH is to be attributed to an adsorption to phenomenon involving a volatilisable oxygen compound of the type postulated by Rheed and Wheeler: this complex, adsorbed on the surface of the carbon particles, has an affinity for OH ions, which it adsorbs from water, making the latter acid. The carbon surface itself appears to have an affinity for H ions, as is indicated by the high pH of the samples low in volatile content. It is pointed out that a low pH carbon in general retards the rate of vulcanisation of rubber with which it is compounded, yet it may be of greater value as a reinforcing agent than one of higher pH, the adsorbed oxygen complex acting as a link between the carbon and rubber. It is calculated that, for a carbon of particle size of 50 μ , the volatile content when the surface of the carbon is completely covered with a monomolecular layer of oxygen atoms, would be 5-6 per cent., and it is considered that if the figure is much below this, loss of value as a reinforcing agent may ensue, and also loss of dispersability in printing ink, and other, media.

Chemical Matters in Parliament

Factory Acts (Safety Precautions)

IN the House of Commons on November 11, Mr. Holdsworth asked the Home Secretary whether it is the practice of his Department to inspect installations of new plant before they are put into operation?

In reply, Sir S. Hoare said the occupier of a factory is responsible for seeing that the plant complies with the Factory Acts and Regulations, but the factory inspectors are instructed that all new works within their jurisdiction should be promptly visited and they often give advice on these and other occasions as to the safety of new plant. The Factory Department assist to a considerable extent by getting into touch with makers of machines on questions of safe design, and that the new Factories Act will place on makers of machines and others an obligation not to sell for use in a factory a machine which does not comply with certain specified requirements.

Fire Prevention (Lacquers)

Mr. Holdsworth asked the Home Secretary whether he proposes to initiate investigations into the possibility of spontaneous combustion of stripped film as a possible source of fires in the making of lacquers?

In reply, Sir S. Hoare said that several fires have occurred in film stripping works where spontaneous combustion was suggested as a possible cause. He understood that there has been some investigation into this problem and he would consider whether further research would lead to useful results.

Nobel Chemistry Awards

English and Swiss Scientists Share Honour

PROFESSOR W. N. HAWORTH, who is director of the department of chemistry at Birmingham University, has, in conjunction with Professor Paul Karrer, of Zurich University, been awarded the Nobel Prize for chemistry. It was Dr. Haworth and collaborators in his laboratory at Edgbaston, who, between 1932 and 1934, determined the constitution of vitamin C, and also succeeded in achieving its synthesis. Vitamin C was the first vitamin to be synthesised, and these researches have made it possible, by technical methods, to produce it on a large scale. Professor Haworth has also engaged in research on carbohydrates, and is now working particularly upon the immuno-polysacchariodes, *i.e.*, the carbohydrates that have the property of producing immunity against disease.

Professor Karrer has been awarded his share of the prize for researches on carotinoides and flavins, and also on vitamins A and B₂. Each of the recipients will receive half of the prize, which, in 1936, was worth approximately £8,000.

Professor Haworth, whose home is at Burnt Green, was born in 1883 at Chorley, Lancashire, and was educated at the Universities of Manchester and Göttingen. In 1910 he graduated Ph.D. at Göttingen, and received the degree of D.Sc. at Manchester in the following year. After holding a demonstratorship in chemistry at the Imperial College of Science and Technology, South Kensington, he was appointed lecturer and subsequently reader in chemistry to the University of St. Andrews, and became professor of organic chemistry at Armstrong College, Durham University, in 1920. Five years later he was appointed professor of chemistry and director of the department of chemistry at Birmingham University. He was elected a Fellow of the Royal Society in 1928 and was Davy medallist in 1934.

Lever Amalgamations

Scheme Sanctioned by Court

MR. JUSTICE SIMONDS, in the Chancery Division on November 15, sanctioned a scheme of arrangement and amalgamation between Unilever, Ltd., and Lever Brothers, Ltd., and confirmed a reduction of the capital of Lever Brothers, Ltd., from £130,000,000 to £117,000,000.

Mr. Fergus Morton, K.C., said that the object of the scheme was to increase the companies' efficiency, as well as to simplify their capital organisation. The reduction of the capital of Lever Brothers, Ltd., was to be effected because Unilever, Ltd., had a holding of stock in Lever Brothers, Ltd., of £13,000,000, and it was proposed, on the amalgamation taking effect, to cancel this stock. There was no opposition, and it was not a scheme in which creditors were affected. The amalgamation would take effect from December 31, 1936, and the name of the company in future would be Lever Brothers and Unilever, Ltd.

In answer to Mr. Justice Simonds, Mr. Morton said that Unilever, Ltd., had always been a holding company. He added that £50,000 was being set aside to meet the creditors of that company, and Lever Brothers, Ltd., were taking over its liabilities.

Oil Refining Works to be Established at Hull

A LARGE vacant mill on the banks of the river at Hull have been acquired by an influential English and Continental firm of oil refiners and makers of compound lard and margarine. There will be an initial outlay of considerably more than £100,000. The labour will be largely local, with the exception of one or two key men who will be brought from the Continent. The industry has been secured for Hull in the face of severe competition from other areas, and following inquiries made by the firm's technical and commercial advisers in various parts of the country.

New Technical Books

THE B.D.H. BOOK OF ORGANIC REAGENTS FOR DELICATE ANALYSIS AND "SPOT" TESTS. Sixth Edition. Pp. 100. London: British Drug Houses, Ltd. 2s. 6d.

Since the publication of the first edition of this book (1932) the use of organic reagents in chemical analysis has been considerably extended. Whereas the earlier editions gave prominence to "spot" tests, the subsequent development of analytical chemistry has revealed the paramount importance of organic reagents for facilitating colorimetric analysis. Thus, while all the original information concerning "spot" tests is retained in the present edition, the full title of the book has been amended in order to emphasise the modern tendency in analytical practice. The application of seventy-two organic reagents is described, or nearly twice the number mentioned in the first issue. The original monographs have been rewritten and amplified in order to embrace the latest researches, and numerous recent references have also been added. The book includes adequate working details for many delicate colorimetric determinations, together with descriptive matter relating to "spot" tests. In addition, accounts of several larger-scale analytical methods employing organic reagents are presented. No attempt has been made to incorporate all the organic substances hitherto suggested as analytical reagents; indeed, the tendency has been to include only those which, after careful trial in the B.D.H. laboratories, appeared to justify a general recommendation.

METALLOGRAPHY. By Cecil H. Desch. Fourth Edition. Pp. 402. London: Longmans, Green and Co. 21s.

The progress which has been made in the scientific study of metals and alloys since the last edition of this book appeared has made drastic revision of the whole work necessary. The general plan has been retained, as having been developed and tested over many years in the teaching of metallurgical students in Glasgow and Sheffield. The aim has been to provide a general introduction to the subject, together with a more detailed discussion of certain topics of special scientific interest. Ternary systems have only been treated briefly as their complications are such that considerable experience is needed before their study can be undertaken with advantage. Although thermal and microscopical analysis remain the foundation of metallographic study, the new knowledge obtained by the use of X-ray methods is so extensive and so important, that it has been essential to include an account of the principles of X-ray analysis and of the experimental methods which may be employed in a metallographic laboratory.

PRINCIPLES OF CHEMICAL ENGINEERING. By W. H. Walker, W. K. Lewis, W. H. McAdams and E. R. Gilliland. Third Edition. Pp. 749. London: McGraw-Hill Publishing Co., Ltd. 30s.

The death of Dr. Walker makes it necessary for an edition of this book to appear without his collaboration and guidance, but every effort has been made to maintain it in the tradition which he established. The last decade has been characterised by the introduction of a large number of new processes, and by important modifications and refinements of old ones. This has been attended by new insight into the underlying mechanisms of the fundamental operations of chemical engineering, in the expansion of the data available for the formulation of quantitative relationship, and in the technique of solving practical problems. In consequence, there is more necessity than ever for the utmost clarity in the presentation of fundamental concepts, for increased emphasis upon the dependability of these concepts as guiding threads through complicated operations and processes, and for the development of trustworthy and usable correlations, and of satisfactory techniques in the solution of practical problems. The major purpose of revision has therefore been to meet this

situation. The most extensive changes are in the chapters on flow of fluids and flow of heat, and in those involving diffusional processes, in which these principles come most directly into play. The theoretical development of the subject has been clarified and emphasis has been laid upon detailed derivation of equations incorporated in the text. With regard to flow of heat there is a careful discussion of the mechanisms of convection and of their relation to the important correlations developed in recent years. The problem of mean temperature difference has been expanded and the treatment of radiation enlarged. A section on dimensional analysis has been added and the utility of consistent units emphasised. The chapters on crushing and grinding, sedimentation, and evaporation are brought up to date. The discussion of filtration is rewritten in an attempt to present for this controversial subject the soundest engineering analysis attainable in the light of present knowledge. The chapters on absorption and extraction, distillation, and air conditioning have been modified in the light of the discussion of diffusion already referred to. The treatment of psychrometry is new and includes humidity charts based on recent data. The chapter on drying gives important new data. Illustrative problems have been revised, and an enlarged list of unsolved problems is appended.

PERSPECTIVES IN BIOCHEMISTRY. Edited by Joseph Needham and David E. Green. Pp. 361. Cambridge: Cambridge University Press. 15s.

The present volume is the result of a decision made some time ago by the past and present students of Sir Frederick Gowland Hopkins to celebrate his 75th birthday by presenting him with a book of essays on modern biochemistry. It was felt that no greater tribute could be paid to the doyen of English biochemistry than a concerted creative efforts by those who had the privilege of his inspiration. The aim of the writers of the essays has been to indicate the most promising lines of advance in the various fields which they have surveyed, and, while maintaining a due standard of criticism, to speculate a little on the likely paths of future thought and discovery. In accordance with the wide interests of the founder and head of the Cambridge Biochemical Laboratory, the essays touch on many aspects of the science of life—physiology and zoology, genetics, medicine, bacteriology and nutrition.

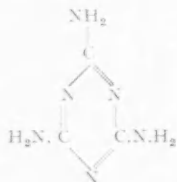
MAN IN A CHEMICAL WORLD. By A. Cressy Morrison. Pp. 292. London: Charles Scribner's Sons, Ltd. 12s. 6d.

This book, according to its foreword, is intended to be educational, "from the cultural as well as the utilitarian points of view." Its object is to impress "the man in the street" with the fact that the chemical industries of the United States render a service that touches practically every activity in which he engages, and to awaken him to the realisation that he is utterly dependent upon these industries not only for the necessities and luxuries of life, but also for his very existence. In 1935 the American Chemical Society celebrated the 300th anniversary of the founding of chemical industries in America. It pointed with pride to a record of achievement which few other American industries can match, and of which every citizen of the United States should be proud. The New York section of the society, through its tercentenary committee, included in its programme the publication of a book (to be written in language that any intelligent person could understand) that would "interpret the vital service of the chemical industries in everyday life in terms of human experience," and thus the book under review came to be written. It is not and was not intended to be a profound contribution to the literature of theoretical or applied chemistry, but merely a book which could give a better understanding of the part that applied chemical science has had in raising the plane of "living" to a higher level than that enjoyed by the immediate previous generation.

The Applications of Melamine

A New Textile Finishing Auxiliary

MELAMINE, a derivative of 1:3:5 triazine is a cyclic compound constituted as follows:—



It is formed as a result of the polymerisation of cyanamide NCNH_2 , which takes place on heating to 150°C . Since there are clear indications in the patent literature of increasing application of this new compound, most particularly in textile finishing, but also in the production of synthetic plastics for the lacquer trade, a few notes on this topic may fulfil a useful purpose.

A new method for preparing melamine has been protected which is said to give a very good yield of the order of 90 to 100 per cent, calculated on the cyanamide taken, whereas by earlier processes low yields of 20 to 30 per cent. were usually encountered. 300 grams of dicyandiamide are heated with an equal weight of liquid ammonia for 6 hours at 160°C . in an autoclave at a pressure not exceeding 200 atmospheres. The residues purified by recrystallisation from boiling water, to which has been added caustic soda which prevents ammeline separating. It may also be purified by sublimation. Dicyandiamide used in the process is formed from calcium cyanamide by boiling it with water, and caustic lime separates



The manufacture of calcium cyanamide, by heating lime and coke in an atmosphere of nitrogen in an electric furnace, is already well known.

Melamine consists of shining monoclinic crystals which are very nearly insoluble in alcohol and ether. It forms salts by combining with one equivalent of an acid. With formaldehyde, melamine forms resinous condensation products which are of considerable interest to textile finishers who are now employing such means for endowing cotton and rayon with crease-resisting qualities. Urea is also frequently used in this connection, but requires the use of an acid to catalyse the condensation with formaldehyde; melamine does not. The early methods of resin impregnation with formaldehyde, urea and an acid, followed by rapid heating when there was a strong probability of cellulose becoming tencer, are now likely to be superseded. The following details illustrate the newer proposal; 20 parts of melamine by weight are made into solution in hot water with 60 parts of 40 per cent. formaldehyde solution, followed by dilution to 200 parts. Viscose rayon fabric is treated in such a solution, centrifuged and dried at a low temperature, and then heated for 40 minutes to 145 to 150°C . to insolubilise and form a resin. Fabrics so treated are stated to be both permanently resistant to creasing and to have a soft handle.

A recent patent to a prominent German chemical concern proposes to use an aqueous liquor containing 2 grams of melamine, 5 grams of stearylamine acetate and 50 c.c. of formaldehyde solution, per litre for endowing cotton fabric with water repellent properties. Cotton piece goods are treated with the above solution on a reel for 15 minutes, are centrifuged and dried for about an hour at 100°C . The water-repellent qualities so acquired are stated to be distinguished by their permanence, and they are not destroyed after subjecting to boiling soap solution. The above treating liquor will keep for several days unimpaired. Stearylamine is obtainable from octadecyl alcohol by treatment first with phosphorous and bromine to give the halide, then by treatment with ammonia to yield the amine.

Tanning with Chromium Sulphate

Investigations of Reactions Involved

EXPERIMENTS which throw considerable light on the mechanism of tanning with chrome sulphate, are described by Cameron and McLaughlin (*Jour. Phys. Chem.*, 1937, 41, 961-973).

A large number of 25 gram samples of hide were suspended in 250 c.c. portions of chrome sulphate solution (made by reduction of sodium bichromate with glucose in sulphuric acid solution) of varying compositions and basicities and the mixtures rotated in closed jars at 90°F . for 48 hours. At the end of this treatment the hide samples were water washed for 48 hours, or else squeezed free of mechanically-bound water in a small hydraulic press. They were then dried, ground, and analysed for "bound" acid and chromium; the distribution of acid between the hide and solution in equilibrium was also determined from measurements on the final solution.

Results indicate that the chromium complex in basic chrome sulphate solutions is initially hydrolysed, and is further hydrolysed by contact with hide, whose protein has an affinity for hydrogen ions (which is apparently increased by tannage), until the basicity of the chrome sulphate solution has so much increased that an insoluble basic sulphate precipitates on the hide. The indications are that the basicity of this compound is 66 per cent. Confirmation was obtained by addition of alkali to a solution which had already reached equilibrium with the hide suspended in it. This increased the adsorption of basic sulphate.

Home Petrol Supply for Sweden

Process for Distillation from Wood

SUCCESSFUL results are stated to have been achieved in the production of petrol and lubricating oils together with various by-products from wood, by a method worked out by two Swedish engineers, Carl Cederqvist and Hilding Bergstrom. For some ten years experiments have been proceeding under the auspices of the Swedish Academy Engineering Research to arrive at a satisfactory method of obtaining liquid fuel from Swedish raw material. Following laboratory experiments on various methods including some in use abroad, which, however, proved to be too expensive for Swedish conditions, a Swedish method was evolved in 1932 and large scale trials have been going on since.

The results from these have proved so satisfactory that the head of the Academy for Engineering Research is able to announce that production of liquid fuel from Swedish wood and charcoal may now be started on a commercial scale. The first plant for that purpose will be started at Perstop in South Sweden. It is anticipated that the necessary machinery, held up because of the large amount of business at Swedish engineering works, will be installed early next year, following which petrol and oil will be produced from Swedish timber.

The method is stated to be quite uncomplicated and the raw material used is waste wood of various kinds and also waste lye from pulp mills, charcoal and wood tars. The material is estimated to yield some 35 per cent. of liquid fuel besides other valuable products.

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Soap Manufacture in Canada

Shipments to the United Kingdom

CANADIAN factories engaged in the manufacture of soaps, washing compounds and cleaning preparations numbered 102 in 1936. The total capital investment was \$11,564,606, as compared with \$14,118,130 in 1935. Employees numbered 1,993, and salaries and wages aggregated \$2,540,559. According to official returns, 39 plants were engaged primarily in the manufacture of soaps; 37 made washing compounds as their main products; cleaning preparations were turned out at 26 plants.

Imports of soap into Canada during 1936 were valued at \$501,991; exports were valued at \$948,810, compared with \$1,321,197 in the previous year. Shipments included 5,415 tons of toilet soap worth \$931,504, sent chiefly to the United Kingdom and the Netherlands.

Personal Notes

MR. D. E. DAVIS has been appointed to the post of assistant analyst, Medical Department, Hong Kong.

MR. H. ATKINSON, deputy government analyst in Ceylon, has become government chemist in Cyprus.

DR. A. G. FRANCIS has been appointed deputy government chemist in succession to Mr. Andrew More, who retired on November 3.

MR. HENRY BOWIE YOUNG, of Kilnquarter House, Bonnybridge, chemical manufacturer, has left personal estate valued at £29,836.

MR. W. S. WALKER, MR. D. W. ADAMSON and MR. T. E. H. HAMPTON have been appointed demonstrators in applied chemistry in the Faculty of Technology at Manchester University.

DR. ALFRED COOPER FRYER, D.Ph., F.S.A., F.I.C., of Eaton Crescent, Clifton, late inspector of alkali and other works, has left estate valued at £28,232, with net personalty £28,132.

MR. GEORGE WILLIAM MULLINS, of Edglaston, for many years a leading member of the non-ferrous metals industry in the Midlands, has left gross estate of the value of £11,208, with net personalty £11,051.

PROFESSOR F. C. THOMPSON, who is professor of metallurgy at Manchester University, has been made a pro-vice-chancellor of the university for a period of two years, in succession to Professor W. L. Bragg.

SIR JOSEPH TURNER, of Birkby Lodge, Huddersfield, has been appointed Prime Warden of the Worshipful Company of Dyers, having been a liveryman since 1918. Sir Joseph is principal of Sir Joseph Turner and Sons, aniline dye manufacturers, Viaduct Street, Huddersfield.

PROFESSOR G. P. THOMSON, of London, is a joint recipient with Dr. C. J. DAVISSON, of New York, of the Nobel Prize for physics. The award has been made for the discovery of interference phenomena when crystals are irradiated with electrons. Professor Thomson holds the chair of physics at the Imperial College of Science. He is the son of Sir J. J. Thomson, who won the Nobel Prize for physics in 1906.

DR. JAMES P. TODD was presented with a solid silver tea and coffee service by the members of the Glasgow and south-western branch of the Pharmaceutical Society, on November 10, at a meeting in the Gordon Restaurant, Glasgow, to mark his recent appointment as professor of pharmacy at the Royal Technical College, Glasgow. Mr. Thomas Guthrie, vice-president of the Society, made the presentation.

MR. C. H. MANLEY, the Leeds City Analyst, discussed the part played by the city analyst in the detection of crime, in a luncheon address to the Leeds Rotary Club on November 12. He pointed out that the analyst had to assist the police in cases concerning provisions of the Poisons and Pharmacy Acts and the Dangerous Drugs Act, and was also called upon to examine drugs which were suspected of having been used for unlawful purposes.

SIR HENRY SUTCLIFFE SMITH, who has been chairman of the Colour Users' Association for the past sixteen years, retired from that position on November 12. He was the guest of the council of the association at a luncheon at the Midland Hotel, Manchester. In appreciation of his work for the association, Sir Henry was presented with a pair of antique silver candlesticks made in London in 1781. Mr. N. G. McCulloch, of the Calico Printers' Association, the new chairman, made the presentation and paid a high tribute to the services which Sir Henry had rendered to all colour users, and also to his able leadership of the association through many difficult years. Sir Henry has now been elected president of the Colour Users' Association for the ensuing year, in the place of Mr. A. K. Davies, who had expressed a wish to be relieved of the presidency.

MME. TATIANA MOROZOVA, has been appointed director of the Soviet Cosmetics Trust.

DR. F. W. EURICH has been awarded the medal of the Textile Institute for research on anthrax.

MR. A. N. DEY, of the Imperial College, Royal College of Science, London, has received the degree of D.Sc. in chemistry from the University of London.

MR. ALFRED EDWIN ALCOCK, of Hazelhurst, Saltburn-by-Sea, formerly general manager of the Cleveland steelworks of Dorman, Long and Co., Ltd., who died on September 15, aged 63, has left estate valued at £2,771 with net personalty £1,567.

DR. E. E. TURNER, of Bedford College, London, has been appointed external examiner in chemistry at Sheffield University; PROFESSOR C. K. INGOLD, F.R.S., of University College, London, has been appointed external examiner for the Ph.D. thesis.

LORD RIVERDALE OF SHEFFIELD has been appointed chairman of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research in succession to the late Lord Rutherford. SIR WILLIAM H. BRAGG is to be a member of the Advisory Council.

OBITUARY

MR. ANTHONY VINCENT TARPEY, managing partner of Fenton Brothers and Tarpey, paint manufacturers, Croston Works, Bury, Lancashire, died on November 9.

MR. JOHN EDWIN ORRELL, head of Joshua Orrell, Ltd., paint manufacturers, Bold Street, Bolton, Lancashire, died on November 10 at the age of 60. He was also a director of Felling Zinc Oxide, Hepburn, Newcastle-on-Tyne.

Foreign Chemical Notes

Manchukuo

THE FIRST FACTORY IN THE FAR EAST to produce glycerine by fermentation has been started up by the Toa Oil and Fat Co. (Toa Yushi Kogyo K.K.).

Japan

CHROME ALUM AND CHROMIUM OXIDE are to be manufactured by the Hokkaido Chrome K.K.

MANUFACTURE OF PRODUCTS FOR THE PHOTOGRAPHIC INDUSTRY is contemplated by the newly-formed Kokusan Kogyo K.K. (capital 2 million yen).

Belgium

THE PHARMACHIMIE S.A., registered in Brussels with a capital of 100,000 francs, is to engage in the production and distribution of chemical and pharmaceutical products.

THE UNION DES FABRIQUES BELGES DE TEXTILES ARTIFICIELS (Fabelta) announces a net profit of 26 million francs from the 1936-37 trading year. Rayon sales in Belgium are still increasing as a result of improved quality and lower prices.

Poland

THE POSSIBILITY OF EXPLOITING POTASSIUM SALT deposits in Western Poland is under consideration.

RED LEAD AND LITHARGE have recently been added to the range of manufactures of the Giesche Co., of Kattowitz.

THE "KRYSTYNA" WHITE LEAD WORKS at Brzowichach-Kamieniu, which has not been working at full capacity for the last few years, is now being completely modernised.

A RESIN-DISTILLING PLANT, with an annual capacity of 3,000 tons raw material, is being constructed in the State Forests at Garbatek. The turpentine output is intended mainly for export; the resin will be consumed on the home market.

From Week to Week

AN ESCAPE OF AMMONIA gas from a valve at Kingston Biscuit Works, Halifax, necessitated a visit by the Halifax Fire Brigade on November 12.

THE BOARD OF TRADE announce that an Order under Section 10(5) of the Finance Act, 1926, exempts R. Mannite (R. Mannitol) from Key Industry Duty from November 17, 1937, until December 31, 1938.

PETROLEUM WHITE OILS of medicinal and technical grades are now of a class or kind made in Canada, according to a memorandum of the Department of National Revenue (Customs Division), Canada.

THE BROADLIE BLEACH WORKS of J. and H. McConnell, Neilston, Renfrewshire, has been acquired by James M'Haffie and Son, Ltd., Kirktonfield, but business will be carried on as before under the name of McConnell.

FACTORIES MAY BE ERECTED in the Outer Hebrides for the conversion of seaweed into transparent wrapping paper and other products. Following a visit by representatives of a Scottish business firm, suitable sites have been selected at South Uist.

THE EASTMAN KODAK CO. has declared the largest "wage dividend" in the history of the company, i.e., bonuses totalling \$3,550,000 (£711,000). The bonuses will be paid on March 1 to workers who have been in the employ of the company eight months or more.

THE COLOUR USERS' ASSOCIATION, at a meeting of their council, held on November 12, elected the following officers for the ensuing year:—President, Sir Henry Sutcliffe Smith; chairman, Mr. N. G. McCulloch; hon. treasurer, Mr. W. W. L. Lishman.

TWO MEN WERE SERIOUSLY HURT and windows in the neighbourhood were shattered by an explosion at the firework factory of Joseph Wells and Sons, Honor Oak Park, London, on November 12. Both men received multiple injuries and burns and were taken to hospital.

THE DEPARTMENT OF OVERSEAS TRADE announces that the United Kingdom Government has decided that it is not possible to accept the French Government's invitation to continue the United Kingdom participation when the Paris International Exhibition is reopened for a further period in 1938.

COMMERCIAL VEHICLES supplied with motive power from gas cylinders on a trailer were envisaged by Dr. E. W. Smith, F.I.C., who gave an address on "The up-grading of coal," to a joint meeting of the Nottingham section of the Institute of Chemistry and the Society of Chemical Industry, on November 11.

THE MANCHESTER SECTION of the Oil and Colour Chemists' Association, held its 13th annual dinner and dance on November 12. Mr. S. T. Kinsman presided, and there was an attendance of 230 persons. Mr. C. A. Klein, technical director of Goodlass Wall and Lead Industries, Ltd., was the principal speaker.

SHAREHOLDERS OF BRANSTON ARTIFICIAL SILK CO., at an extraordinary meeting held on November 15, sanctioned the agreement by which Branston Artificial Silk is to purchase for £125,000 the undertaking and assets, including goodwill, of St. Martin Preserving Co., and change its name to that of the last-named concern.

THE RECENT MEETING IN PARIS of the International Carbide Cartel did not result in a renewal of the cartel, which, according to present arrangements, is due to expire at the end of March, 1938. The cartel has been in existence for fifteen years. It comprises all the important manufacturers of carbide in Europe, and fixes prices and quotas for export to all parts of the world.

REPRESENTATIVES OF THE SOUTH YORKSHIRE COKE PRODUCERS' FEDERATION and ironmasters of the Midlands, held a conference at Sheffield on November 12, with the object of endeavouring to stabilise prices of coke for the production of pig iron. The proceedings were private. It was stated afterwards that the ironmasters were unable to accept the terms placed before the meeting by the coke producers, and that no further meeting had been arranged.

CHINA CLAY SHIPMENTS from Cornwall are rapidly rising. Though there were no shipments during October either at Looe or Padstow, the total tonnage dealt with at the Cornish ports aggregated 93,338 tons—82,879 tons china clay, 4,763 tons china stone, 5,746 tons of ball clay. Compared with a total tonnage of 80,234 tons in October, 1936, made up of 71,665 tons china clay, 5,355 tons china stone, and 3,214 tons ball clay respectively, an increase of 11,104 tons.

A SYNDICATE HEADED BY CORY BROTHERS, LTD., of London, coal and oil depot owners, is to exploit 5,000 acres on the south border of the Poza Rica oilfield, four-fifths of which is already controlled by a British-owned company, a subsidiary of the Mexican Eagle Co. The terms include a condition that the syndicate must drill 20 wells and the Mexican Government will take a 35 per cent. royalty. The syndicate is to advance £1,000,000 to the Mexican Government, taking payment in petroleum.

THE LAUTIER SCENT FACTORY at Grasse was partly destroyed by fire on November 11.

ROBINSON BINDLEY PROCESSES, LTD., of 31 East Street, Epsom, Surrey, have changed their name to Synthetic Oils, Ltd. The address of the registered office remains the same.

THE NATIONAL UNION OF SHALE MINERS AND OILWORKERS have lodged a claim with the Scottish Oils, Ltd., for a 10 per cent. increase on all standard wages, and eight days' holiday per year with pay.

CHEQUES TO THE VALUE OF £130,000 were sent out at the week-end to 3,500 growers for the British Sugar Corporation's Peterborough factory in respect of beet deliveries made during the past month, for a total of approximately 77,200 tons of beet.

IN THE CHANCERY DIVISION, on November 15, Mr. Justice Simonds made an order for the compulsory winding-up of the British Rubber and General Trust, Ltd. This company was registered in 1928, and has an issued capital of £500,000 in £1 shares.

THE INSTITUTION OF CHEMICAL ENGINEERS announce that application forms for the 1938 associate-membership examinations are returnable not later than December 20. Forms and particulars of the examination can be obtained on application to the Hon. Registrar, Institution of Chemical Engineers, 56 Victoria Street, Westminster, S.W.1.

THE FIRST FACTORY TO BE COMPLETED on the Scottish Industrial Estate at Hillington, near Glasgow, will be occupied by Compact Chemicals, Ltd. Mr. Walter Elliot, M.P., Secretary of State for Scotland, has accepted the invitation of the directors of the Scottish Industrial Estates, Ltd., to perform the opening ceremony of the estate at this new chemical factory.

IT IS UNDERSTOOD THAT THE ERECTION OF A FACTORY for the manufacture of calcium carbide at Corpach in the Highlands is held to be desirable in the national interest by the Cabinet, and a further project to erect a subsidiary factory in South Wales is also deserving of Government support. The Caledonian Power Bill, which has been rejected twice by the House of Commons, is therefore to be reintroduced at once.

AS THE RESULT OF AN ACCIDENT in the science room at Auchinleck Public School, Ayrshire, on November 12, a girl pupil, Bridget McCall, aged 14, has had her right eye removed at the Glasgow Eye Infirmary. She is a pupil of Birnieknowe School, Auchinleck, and with other members of her class was attending the public school for instruction in domestic and science subjects. The accident occurred during a chemical experiment, when a test tube containing a mixture of chemicals exploded.

A BRONZE PLAQUE OF THE LATE LORD BROTHERTON, the work of Mr. Frank Bowcher, will shortly be exhibited at the Wakefield Art Gallery, for a period of six months. It has been made for Mrs. McGrigor Phillips (Dorothy Una Ratcliffe), of Temple Sowerby Manor, Penrith, and late of Roundhay Hall, Leeds. At a later date the plaque will be exhibited in various towns where chemical works were owned by the late Lord Brotherton, and ultimately will be presented to some institution in the West Riding of Yorkshire.

THE DEVELOPMENT, APPLICATION AND USES of activated carbon as a purification medium, are discussed in a recent 98-page publication of the Industrial Chemical Sales Division of the West Virginia Pulp and Paper Co., entitled "The Modern Purifier." Many helpful suggestions are given, including one chapter on new and potential uses, such as odour control in food refrigeration, the reclaiming of transformer oil, and removal of toxic materials which retard enzyme action with chrome tanning process for leather.

THE OFFICES OF THE SOCIETY OF PUBLIC ANALYSTS have been transferred to 7 and 8 Idol Lane, London, E.C.3; (Telephone: Mansion House 1745/6). As already announced in THE CHEMICAL AGE, Dr. C. Ainsworth Mitchell, editor of "The Analyst," and hitherto also secretary to the society, has resigned the office of secretary and Mr. J. H. Lane has been appointed in his place. Communications relating to the routine business of the society should therefore be addressed to Mr. J. H. Lane, at 7-8 Idol Lane, London, E.C.3, whereas communications relating to "The Analyst" should be addressed to Dr. C. A. Mitchell, M.A., F.I.C., at 16 Blomfield Road, London, W.9.

ACCORDING TO THE BOARD OF TRADE RETURNS for October, 1937, exports of chemicals, drugs, dyes and colours were valued at £2,095,650, as compared with £1,910,341 for October, 1936. Imports were valued at £1,294,356, as compared with £1,216,456; re-exports were £45,957. There was an increase in exports of bleaching powder, £19,368 (as compared with £11,882); tar oils, creosote oil, etc., £116,997 (£51,798); copper sulphate, £19,803 (£7,164); insecticides, etc., £29,266 (£70,179); fertilisers, excluding ammonium sulphate, £82,686 (£54,197); soda ash, crystals and bicarbonate, £97,585 (£69,533); and caustic soda, £94,661 (£76,321). Imports of kainite and other mineral potassium fertiliser salts decreased from £69,817 to £35,929.

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

- LIQUID TREATING APPARATUS.—Aluminium Plant and Vessel Co., Ltd. 30826.
- SYNTHETIC RESINS.—D. G. Anderson and R. L. Yeates. 30322.
- CENTRIFUGES.—Baird and Tatlock (London), Ltd. 30898.
- PRODUCTION OF DIFFERENTIAL DYEING.—Bleachers' Association, Ltd., F. W. Birch, W. Kershaw, and L. W. Oldham. 30680.
- MANUFACTURE OF CERAMIC PRODUCTS.—R. Bosch A.-G. (Germany, Dec. 1, '36.) 30528.
- PRODUCTION OF MOULDING COMPOSITIONS.—British Celanese, Ltd. (June 10, '36.) 30508.
- CONCENTRATION OF ALIPHATIC ACIDS.—British Celanese, Ltd. (United States, Nov. 14, '36.) 30726.
- RECOVERY OF CARBON DISULPHIDE.—Carbo-Norit-Union Verwaltungen-Ges. (Germany, Jan. 28, '36.) 30307.
- EXTRACTION OF DILUTE ORGANIC ACIDS.—Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler. (German, Nov. 10, '36.) 30893.
- EXTRACTION OF DILUTE ORGANIC ACIDS.—Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler. (Germany, Dec. 16, '36.) 30694.
- POLYMERISATION OF ORGANIC COMPOUNDS.—Distillers Co., Ltd., G. Minkoff, H. M. Stanley and J. E. Youell. 30388, 30389.
- MANUFACTURE OF ORGANIC SUBSTANCES.—H. Dreyfus. 30509.
- PURIFICATION OF ALKALI METALS.—E. I. du Pont de Nemours and Co. (United States, Nov. 4, '36.) 30196.
- RECOVERY OF METALS FROM THEIR AMALGAMS.—E. I. du Pont de Nemours and Co. (United States, Nov. 4, '36.) 30298.
- MANUFACTURE OF ALKALI METALS.—E. I. du Pont de Nemours and Co. (United States, Nov. 4, '36.) 30299.
- MANUFACTURE OF CHLORINATED ALIPHATIC HYDROCARBONS.—E. I. du Pont de Nemours and Co. (United States, Nov. 5, '36.) 30421.
- REFINING OF HYDROCARBON OILS.—Edeleanu Ges. (Germany, Nov. 7, '36.) 30624.
- MANUFACTURE OF PHENOL FORMALDEHYDE RESINS.—S. de Faveri and Orbellio, Ltd. 30566.
- PRODUCTION OF WATER-SOLUBLE NITROGENOUS COMPOUNDS.—J. R. Geigy A.-G. (Switzerland, July 8, '36.) 30629.
- RUBBER ANTIOXIDANTS.—R. F. Goldstein, W. Baird, Imperial Chemical Industries, Ltd., and M. Jones. 30300.
- MANUFACTURE OF POLYMERISATION PRODUCTS.—W. W. Groves (I. G. Farbenindustrie). 30494.
- MANUFACTURE OF PANCREAS HORMONE PREPARATIONS.—W. W. Groves (I. G. Farbenindustrie). 30495.
- MANUFACTURE OF VINYL METHYLKETONE.—W. W. Groves (I. G. Farbenindustrie). 30622.
- MANUFACTURE OF TRIARYLMETHANE DYESTUFFS.—W. W. Groves (I. G. Farbenindustrie). 30623.
- MANUFACTURE OF TRIPHENYLMETHANE DYESTUFFS.—W. W. Groves (I. G. Farbenindustrie). 30739.
- CHEMICALLY BONDED REFRACTORIES.—L. Hodnett, N. P. Pitt and F. E. Lathe. (United States, April 24, '36.) 30375.
- MANUFACTURE OF 2, 4-dioxo-3, 3-dialkyl- and di-n-propyl-6-methyl-1, 2, 3, 4-tetrahydropyridine.—F. Hoffman-La Roche and Co., A.-G. (Switzerland, Dec. 2, '36.) 30690.
- CONVERSION OF HYDROCARBONS.—Houdry Process Corporation. (United States, Nov. 20, '36.) 30727. (United States, Dec. 19, '36.) 30728. (United States, Feb. 15, '36.) 30729.
- PRODUCTION OF LIQUID POLYMERS OF OLEFINS.—Houdry Process Corporation. (United States, Nov. 23, '36.) 30730.
- WORKING-UP OF THE NITROUS GASES OF THE AMMONIA COMBUSTION TO NITRIC ACID.—Hydro Nitro Soc. Anon. and M. J. Kalous. (Austria, April 13, '36.) 30673.
- MANUFACTURE OF AROMATIC AMINO-COMPOUNDS.—I. G. Farbenindustrie. (April 5, '36.) (Germany, April 4, '36.) 30631.
- REMOVAL OF GASEOUS WEAK ACIDS FROM GASES.—G. W. Johnson (I. G. Farbenindustrie). 30256.
- POLYMERISATION OF OLEFINS.—G. W. Johnson (I. G. Farbenindustrie). 30257.
- MANUFACTURE OF AROMATIC HYDROCARBONS.—G. W. Johnson (I. G. Farbenindustrie). 30258.
- DEHYDRATION OF ALCOHOLS.—G. W. Johnson (I. G. Farbenindustrie). 30470.
- DESTRUCTIVE HYDROGENATION, ETC., OF SOLID CARBONACEOUS SUBSTANCES.—G. W. Johnson (I. G. Farbenindustrie). 30646.
- MANUFACTURE OF DIOLFINES.—G. W. Johnson (I. G. Farbenindustrie). 30647.
- PRODUCTION OF LIQUEFIED CHLORINE.—G. W. Johnson (I. G. Farbenindustrie). 30868.
- PRODUCTION OF HYDROCARBON PRODUCTS.—G. W. Johnson (I. G. Farbenindustrie). 30869.
- MANUFACTURE OF SALTS OF CELLULOSE-ETHER CARBOXYLIC ACIDS.—Kalle and Co., A.-G. (Germany, November 21, '36.) 30627. (Germany, June 22, '36.) 30628.
- MANUFACTURE OF PIGMENTS.—E. M. Meade. 30345.
- REFINING, ETC., OF LIQUID, ETC., CONTAINING FAT OR OIL.—J. Mayer. (Germany, December 15, '36.) 30568.
- PRODUCTION OF HYDROCARBON DERIVATIVES.—A. L. Mond (Universal Oil Products Co.) 30783.
- PRODUCTION OF HYDROCARBONS.—A. L. Mond (Universal Oil Products Co.) 30784.
- MANUFACTURE OF ACIDS.—H. F. Oxley. 30228.
- BONDING OF CALCIUM SILICATES.—N. P. Pitt, and E. G. Baker. (United States, April 1, '36.) 30374.
- REFINING OF LEAD.—Soc. Miniere and Metallurgique de Penarroya. (France, January 11, '36.) 30415.
- HYDROLYTIC DECOMPOSITION OF TITANIUM SALT SOLUTIONS.—Titan Co., Inc. (United States, November 6, '36.) 30413.
- TREATMENT OF MATERIALS CONTAINING TANTALUM, ETC.—W. W. Triggs. 30564.
- VULCANISATION OF RUBBER.—Wingfoot Corporation. (United States, March 26, '36.) 30711.
- VULCANISATION OF RUBBER.—Wingfoot Corporation. (United States, March 30, '36.) 30712.
- ATOMIZERS FOR HYDROCARBONS.—A. Bargeboer. 29492.
- FINISHING-PROCESSES FOR TEXTILE MATERIALS.—A. E. Battye, Tootal Broadhurst Lee Co., Ltd., E. J. Candlin, and J. Tankard. 29900.
- PROCESS FOR OPENING UP MATERIALS CONTAINING CELLULOSE.—H. Berkel. (German, May 27, '36.) 29724.
- NITRATION OF CELLULOSE, ETC.—E. Berl. 29883.
- REFINING OF MINERAL AND VEGETABLE OILS, ETC.—J. B. Beyer. (France, Oct. 30, '36.) 29816.
- METHODS OF MAKING ALLOY ADDITIONS TO CAST IRON.—Bradley and Foster, Ltd., and J. E. Hurst. 29840.
- REFINING OF PIG-IRON, ETC.—H. A. Brassert and Co., Ltd. (Rochling'sche Eisen- und Stahlwerke Ges.) 29519, 29520.
- MANUFACTURE OF POLYMERISED ORGANIC COMPOUNDS.—British Celanese, Ltd. (United States, Nov. 7, '36.) 29635.
- PREPARATION OF SUSPENSIONS OF TITANIUM PIGMENTS.—British Titan Products Co., Ltd. (United States, Nov. 5, '36.) 29703.
- MANUFACTURE OF METHYLACRYLIC-ACID ESTERS.—J. H. Brown. 29514.
- MANUFACTURE OF RESINOUS ESTERIFICATION PRODUCTS.—K. R. Brown, and Atlas Powder Co. 29637.
- HYDRATION OF OLEFINS.—Carbide and Carbon Chemicals Corporation. (United States, Nov. 25, '36.) 29566.
- MANUFACTURE OF WATER-INSOLUBLE AZO-DYESTUFFS.—A. Carpmal (I. G. Farbenindustrie, A.-G.) 29969.
- MANUFACTURE OF ORTHO- AND PARA-AMINOARYL SULPHONES.—A. Carpmal (I. G. Farbenindustrie, A.-G.) 29970.
- MANUFACTURE OF SULPHUR DYESTUFFS.—A. Carpmal (I. G. Farbenindustrie, A.-G.) 29971.
- MANUFACTURE OF SOLUTIONS OF CELLULOSE, ETC.—Cellulose Holdings, Ltd. (United States, Dec. 4, '36.) 30132.
- MANUFACTURE OF THORIUM OXIDE, ETC.—Chemische Fabrik von Heyden, A.-G. (Germany, Oct. 29, '36.) 29624.
- MANUFACTURE OF COMPOSITE GLASS-METAL ARTICLES.—F. B. Dehn (Hygrade Sylvania Corporation.) 29858.
- PRODUCTION OF DI-VINYLATED AROMATIC HYDROCARBONS, ETC.—Distillers Co., Ltd., J. E. Touell, G. Minkoff, and H. M. Martin. (Oct. 30, '36.) 29867.
- PRODUCTION OF ARYL-SUBSTITUTED OLEFINS.—Distiller Co., Ltd., G. Minkoff, H. M. Martin, and J. E. Touell. (Oct. 30, '36.) 29868.
- CENTRIFUGAL SEPARATORS.—H. W. Fawcett. 29966.
- TREATMENT OF TEXTILE MATERIALS.—E. Franz. (Germany, Nov. 4, '36.) 29962.
- PRODUCTION OF N-ACYLURETHANES.—J. R. Geigy, A.-G. (Switzerland, July 12, '36.) 29645.
- MONOETHERS OF DUROHYDROQUINONE.—Glaxo Laboratories, Ltd., and B. K. Blount. 29975.
- PREPARATION OF AROMATIC ISOTHIOCYANATES.—S. Goldschmidt, and K. Martin. (Germany, Nov. 24, '36.) 30007.
- STABILISATION OF SUBSTANCES YIELDING OXYGEN.—W. W. Groves (I. G. Farbenindustrie, A.-G.) 29837.
- MANUFACTURE OF PRODUCTS CONTAINING VALUABLE HYDROCARBONS, ETC.—I. G. Farbenindustrie, A.-G. (Germany, Nov. 4, '36.) 29636.
- PRODUCTION OF PHOTOGRAPHIC STEREOSCOPIC COLOUR PICTURES.—I. G. Farbenindustrie, A.-G. (Germany, Oct. 30, '36.) 29832.
- MANUFACTURE OF AZO-DYESTUFFS.—I. G. Farbenindustrie, A.-G. (Germany, Nov. 4, '36.) 29834.
- MANUFACTURE OF METHYLACRYLIC-ACID ESTERS.—Imperial Chemical Industries, Ltd., and G. E. Wainwright. 29541.
- FILMS, ETC., PREPARED FROM SOLUTIONS.—Imperial Chemical Industries, Ltd. 29542.
- MANUFACTURE OF HETEROCYCLIC COMPOUNDS.—Imperial Chemical Industries, Ltd. 29670, 29999.
- MANUFACTURE OF LEUCO SULPHURIC ACID ESTERS OF DYESTUFFS OF ANTHRAQUINONE SERIES.—G. W. Johnson (I. G. Farbenindustrie, A.-G.) 29623.

BREAKING-DOWN OF COAL, ETC.—Imperial Chemical Industries, Ltd. 29998.
MANUFACTURE OF HIGH CHROMIUM IRONS, ETC.—Imperial Chemical Industries, Ltd., and E. W. Colbeck. 30177.
PRODUCTION OF WATERPROOF FILMS, ETC.—International Containers, Ltd. (Germany, Nov. 30, '36.) 29873.
MANUFACTURE OF VAT DYESTUFFS.—G. W. Johnson (I. G. Farbenindustrie, A.-G.) 29644.

Specifications Open to Public Inspection

PROCESS FOR THE PRODUCTION and purification of sexual hormone derivatives.—Chemical Works of G. Richter, Ltd. (Cognate Application, 5324/37.) May 5, 1936. 5323/37.
MANUFACTURE OF DISAZO-DYESTUFFS.—J. R. Geigy, A.-G. May 8, 1936. 6229/37.
PREPARATION OF ALPHA, BETA, UNSATURATED KETONES.—Carbide and Carbon Chemicals Corporation. May 8, 1936. 10689/37.
PROCESSES FOR WORKING-UP AQUEOUS FORMALDEHYDE SOLUTIONS.—Deutsche Gold- und Silberscheideanstalt vorm. Roessler. May 8, 1936. 11327/37.
MANUFACTURE OF AZO-DYESTUFFS.—J. R. Geigy, A.-G. May 6, 1936. 11881/37.
PROCESS FOR MANUFACTURING HIGHLY VISCOUS PRODUCTS obtained by the polymerisation of fatty oils.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. May 8, 1936. 12292/37.
PROCESS FOR THE TREATMENT OF NATURAL AND ARTIFICIAL FIBRES WITH ALKALI.—Chemical Works, formerly Sandoz. May 2, 1936. 12493/37.
MANUFACTURE OF NITRO-DYESTUFFS.—I. G. Farbenindustrie. May 2, 1936. 12568. 12568/37.
MANUFACTURE AND PRODUCTION OF HYDROGEN.—I. G. Farbenindustrie. May 8, 1936. 12703/37.
PROCESS OF PRODUCING HYDROLYSED CELLULOSE ESTERS of reduced viscosity, and manufacture of varn and other products therefrom.—Kodak, Ltd. May 7, 1936. 13083/37.
METHOD OF PRODUCING highly lustrous hollow bodies from cellulose products and other plastic substances.—International Container, Ltd. May 7, 1936. 13084/37.
METHOD OF PRODUCING highly lustrous bodies from acetyl cellulose and other cellulose esters and ethers.—International Container, Ltd. May 7, 1936. 13085/37.
MANUFACTURE OF ORTHO-HALOGEN-ANTHRAQUINONE- β -CARBOXYLIC ACIDS.—I. G. Farbenindustrie. May 8, 1936. 13272/37.
PROCESS OF MAKING ALKALI SUB-SILICATES.—Pennsylvania Salt Manufacturing Co. (Divided out of 9492/36.) April 10, 1935. 29997/37.
MANUFACTURE OF AROMATIC AMINO-COMPOUNDS.—I. G. Farbenindustrie. (Divided out of 9599/37.) April 4, 1936. 30631/37.

Specifications Accepted with Date of Application

MANUFACTURE AND PRODUCTION OF HALOGENATED PHTHALOCYANINES.—G. W. Johnson (I. G. Farbenindustrie.) March 5, 1936. (Cognate Application, 6692/36.) 474,740.
REACTION OF CARBON MONOXIDE WITH HYDROGEN.—G. W. Johnson (I. G. Farbenindustrie.) March 26, 1936. 474,448.
PRODUCTION OF ZINC COATINGS BY ELECTRODEPOSITION.—Imperial Chemical Industries, Ltd. March 27, 1936. 474,449.
MANUFACTURE AND PRODUCTION OF NITROGENOUS CONDENSATION PRODUCTS.—G. W. Johnson (I. G. Farbenindustrie.) March 30, 1936. 474,601.
PROCESS OF TREATMENT OF MATERIALS CONTAINING TANTALUM and/or niobium.—W. W. Triggs (Soc. Generale Metallurgique de Hoboken.) April 28, 1936. 474,604.
METHOD OF PRODUCING THERAPEUTICALLY and disinfectantly active substances.—Syngala Fabrik fur Chemisch-Synthetische und Galenische Arzneimittel Ges., and F. Feigl. May 3, 1935. 474,614.
MANUFACTURE OF AZO DYESTUFFS.—I. G. Farbenindustrie. June 6, 1935. 474,678.
SOFTENING OF NITROCELLULOSE PLASTICS and compositions therefor.—E. I. Du Pont de Nemours and Co. May 9, 1935. 474,762.
MANUFACTURE OF ORGANOMAGNESIUM COMPOUNDS.—W. W. Groves (I. G. Farbenindustrie.) May 7, 1936. 474,687.
DYEING OF CELLULOSE TEXTILES.—I. G. Farbenindustrie. May 9, 1935. 474,778.
HARDENING PROCESSES FOR MAGNESIUM BASE ALLOYS.—High Duty Alloys, Ltd., and R. Jones. May 8, 1936. 474,812.
MANUFACTURE OF POLYHYDRIC ALCOHOL-POLYBASIC ACID RESINS.—K. Sandig. May 8, 1936. 474,620.
PROCESS FOR THE MANUFACTURE OF DYED CELLULOSIC MATERIALS.—I. G. Farbenindustrie. May 31, 1935. 474,796.
APPARATUS FOR THE DEGASIFICATION OF ALKALINE LIQUIDS laden with hydrogen sulphide.—G. W. Johnson (I. G. Farbenindustrie.) August 14, 1936. 474,649.
PRODUCTION OF HYDROGEN PEROXIDE.—Naamlooze Vennootschap Industriële Maatschappij Voorheen Noury and Van Der Lande. December 21, 1935. 474,709.
PROCESSES FOR THE PURIFICATION and/or decolourisation of oils and fats.—E. Kellens. January 2, 1936. 474,504.
LOW-TEMPERATURE BRAZING ALLOYS for uniting aluminium alloys.—J. Schmit, and P. Pichard. January 20, 1936. 474,716.
PROCESSES FOR THE FRACTIONAL DECOMPOSITION of hydrocarbon mixtures.—J. Pintsch, A.-G. March 3, 1936. 474,508.
PRODUCTION OF SODIUM POLYSILICATES.—W. H. A. Thiemann (I. G. Farbenindustrie.) April 16, 1937. 474,729.
PROCESS FOR DEOXIDATION OF COPPER.—Soc. d'Electro-Chimie, d'Electro-Metallurgie, et des Acieries Electriques d'Ugine. June 16, 1936. 474,585.

Chemical and Allied Stocks and Shares

A NEW Stock Exchange account began on Monday and early in the week industrial and other shares were more active at better prices. Later there was a reaction in sympathy with the trend of Wall Street, as markets continue to move largely with that centre, and the view is gaining ground that the upward movement of trade activity in the United States is unlikely to be resumed until after the turn of the year.

Imperial Chemical have been relatively steady and at 36s. 6d. are 4½d. better than a week ago. It is pointed out in the market that, on the basis of last year's 8 per cent. dividend, quite a favourable yield is offered and that there is a possibility of a small increase in the distribution for the current year. Turner and Newall are 83s. 1½d. at the time of writing, compared with 85s. 9d. a week ago, awaiting the dividend announcement. The tendency in the market is to take the view that conditions in the building trade may be the chief factor affecting the earning power of the business; but it has to be remembered that asbestos is employed in a variety of trades, and that its uses are increasing. Associated Portland Cement have recovered 2s. 6d. to 90s., at which a yield of around 5 per cent. is offered. The market is taking the view that for the current year there seems reasonable prospects of the total payment again being brought up to 22½ per cent. Alpha Cement and various other cement shares attracted buyers on any decline in price, as did British Plaster Board ordinary.

Borax Consolidated have gone back further from 28s. 6d. to 27s. 9d. on the possibility that the outlook may be bound up with conditions in the United States where the company has important factories and mines. Imperial Smelting were better at 13s. 9d., having shown some response to the improved price of zinc. Richard Thomas were steadier, the interim dividend decision having aroused hopes that the total payment may be maintained at 15 per cent. on the enlarged capital. Most other iron, steel, and allied shares were reactionary. Dorman Long went back on the 10 per cent. dividend, a larger payment than this having been hoped for in the market. The preliminary figures show that the directors are following a very conservative policy.

British Oxygen improved moderately to 88s. 9d. Although on the basis of last year's 15 per cent. dividend the yield is small, the assumption is that it may be decided to distribute a further scrip bonus with the final dividend. Pinchin Johnson at 40s. are within a few pence of the price recorded here a week ago, and most other paint shares were also little changed. The very conservative dividend policy being followed by Lewis Berger is not viewed in the market as indicating doubts as to the outlook for the trade, and is regarded largely as a precautionary measure as the company has important subsidiaries overseas and abroad.

Boots Drug have gone back sharply from 48s. to 46s. 6d., but this is attributed entirely to the trend of markets as there is general confidence the distribution for the year will be maintained and that sooner or later there is likely to be a share bonus. Timothy Whites and Taylors lost 6d. to 30s., but are now "ex" the interim dividend. Sangers were steady at 23s. and British Drug Houses kept at 23s. 6d. International Combustion transferred around 102s. 6d. at which a large yield is offered on the basis of last year's 30 per cent. payment, which it is hoped in the market will be maintained.

Unilever were better at 36s. although now "ex" the interim dividend. The increase in the latter created an excellent impression in the market and is regarded as arising largely from the benefits expected to be derived from the merger with Lever Brothers, effect to which is expected to be given shortly. It may be recalled that it has been stated officially that the merger should make for larger dividends for Unilever shareholders. British Match at 36s. 9d. have retained the better price made recently. British Industrial Plastics lost 3d. to 2s. 6d., but are now "ex" the dividend. British Glues received more attention and have improved a few pence to around 6s. 6d. Fison, Packard and Prentice declined to 34s. 3d. and Cooper, McDougall and Robertson to 33s. 6d. B. Laporte were done around 98s. 9d.; the interim dividend falls to be announced shortly.

"Shell" and other leading oil shares have fluctuated sharply, despite less talk of a possible decrease in the price of petrol before the end of the year.

Weekly Prices of British Chemical Products

STEADY to firm conditions prevail throughout the chemical markets, the volume of trade being perhaps a little better than the normal for the period. Apart from a seasonal slackening of interest in one or two items, inquiries are well spread throughout the market and a fairly substantial forward business is being transacted. With the exception of a rise of £1 per ton in the price of red lead there are no important price changes to record for general chemicals, rubber chemicals and wood distillation products. In the coal tar section interest is mainly centred on the forward position. Buyers are holding off and the market has an inactive appearance. Carbolic acid crystals are not quite so firm and quotations for cresylic acid are easier. Toluol, xylol, and pitch are quiet and there is only a small demand for naphthalene. The demand for pyridine has been well maintained, but quotations are unaltered.

MANCHESTER.—Relatively quiet conditions have been reported this week in most sections of the Manchester chemical market.

Price Changes

Rises: Lead, red; tartaric acid (Manchester); naphthalene.

Falls: Oxalic acid (Manchester); cresylic acid, 97/99%, 99/100%, pale 99/100%, dark 95%; naphtha, solvent, 95/160%; pyridine; toluol, pure.

Sellers state that new business is at a seasonally low ebb and is likely to remain so until the 1938 price position is clearer. Following the lead of alkali a few weeks ago an advance in contract prices in both liquid and solid caustic soda is stated to have been decided upon and there is a feeling, largely on the ground of the higher cost of coal, that further rises will be put into operation. In the meantime, business this week has been confined more or less to odd parcels, with, however, a steady flow of delivery specifications from users in the district against old contracts. The by-products market is only moderately active, and here and there the price tendency is easy.

GLASGOW.—There has been a falling off in the demand for chemicals for early delivery, both for home trade and export, though more interest is now being shown in forward bookings for 1938. Prices generally continue very firm, though copper and lead products are easier on account of the lower prices for the metals.

General Chemicals

ACETONE.—£45 to £47 per ton.

ACETIC ACID.—Tech., 80%, £28 5s. per ton; pure 80%, £30 5s.; tech., 40%, £15 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. **MANCHESTER:** 80%, commercial, £30 5s.; tech. glacial, £42 to £46.

ALUM.—Loose lump, £8 7s. 6d. per ton d/d; **GLASGOW:** Ground, £10 7s. 6d. per ton; lump, £9 17s. 6d.

ALUMINIUM SULPHATE.—£7 per ton d/d **Lancs.;** **GLASGOW:** £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 1s. to 1s. 1d. per lb. d/d in cylinders. **SCOTLAND:** 10½d. to 1s. 0½d., containers extra and returnable.

AMMONIA, LIQUID.—**SCOTLAND:** 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE.—Grey galvanising, £17 10s. per ton, ex wharf.

AMMONIUM CHLORIDE (MURIATE).—**SCOTLAND:** British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Sal ammoniac.)

AMMONIUM DICHROMATE.—8d. per lb. d/d **U.K.**

ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—Continental material £11 per ton c.i.f., **U.K.** ports; Cornish White, £12 5s. to £12 10s. per ton f.o.r., mines, according to quantity. **MANCHESTER:** White powdered Cornish, £17 per ton, ex store.

BARIUM CHLORIDE.—£11 10s. to £12 10s. per ton in casks ex store. **GLASGOW:** £11 10s. per ton.

BLEACHING POWDER.—Spot, 35/37%, £8 15s. per ton in casks, special terms for contracts. **SCOTLAND:** £9 per ton net ex store.

BORAX COMMERCIAL.—Granulated, £16 per ton; crystal, £17; powdered, £17 10s.; extra finely powdered, £18 10s., packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. **GLASGOW:** Granulated, £16, crystal, £17; powdered, £17 10s. per ton in 1-cwt. bags, carriage paid.

BORIC ACID.—Commercial granulated, £28 10s. per ton; crystal, £29 10s.; powdered, £30 10s.; extra finely powdered, £32 10s. in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. **GLASGOW:** Crystals, £29 10s.; powdered, £30 10s. 1-cwt. bags in 1-ton lots.

CALCIUM BISULPHITE.—£6 10s. per ton f.o.r. **London.**

CHARCOAL, LUMP.—£6 to £6 10s. per ton, ex wharf. Granulated, £7 to £9 per ton according to grade and locality.

CHROMETAN.—Crystals, 2½d. per lb.; liquor, £19 10s. per ton d/d station in drums. **GLASGOW:** 70/75% solid, £5 15s. per ton net ex store.

CHROMIC ACID.—9½d. per lb., less 2½%; d/d **U.K.**

CITRIC ACID.—1s. 0½d. per lb. **MANCHESTER:** 1s. **SCOTLAND:** B.P. crystals, 1s. 0½d. per lb.; less 5%, ex store.

COPPER SULPHATE.—£21 7s. 6d. per ton, less 2% in casks. **MANCHESTER:** £19 per ton f.o.b. **SCOTLAND:** £21 per ton, less 5%, Liverpool, in casks.

CREAM OF TARTAR.—100%, 92s. per cwt., less 2½%. **GLASGOW:** 99%, £4 12s. per cwt. in 5-cwt. casks.

FORMALDEHYDE.—£22 10s. per ton.

FORMIC ACID.—85%, in carboys, ton lots, £42 to £47 per ton.

GLYCERINE.—Chemically pure, double distilled, 1.260 s.g., in tins, £5 7s. 6d. to £6 7s. 6d. per cwt. according to quantity; in drums, £5 to £5 13s. 6d.

HYDROCHLORIC ACID.—Spot, 5s. to 7s. 6d. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 6s. 4d. per lb. in 7 lb. lots.

LACTIC ACID.—(Not less than ton lots) Dark, 50% by volume, £23 10s.; by weight, £27 10s.; Pale, 50% by volume, £27; by weight, £32 per ton. **LANCASHIRE:** Dark tech., 50% by

vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50%, by vol., £41. One-ton lots ex works, barrels free.

LEAD ACETATE.—**LONDON:** White, £31 10s. ton lots; brown, £35. **GLASGOW:** White crystals, £32 10s.; brown, £1 per ton less. **MANCHESTER:** White, £35; brown, £34.

LEAD NITRATE.—£34 per ton for 1-ton lots.

LEAD, RED.—£32 15s. 0d., 10 cwt. to 1 ton, less 2½% carriage paid. **SCOTLAND:** £32 per ton, less 2% carriage paid for 2-ton lots.

LITHARGE.—**SCOTLAND:** Ground, £32 per ton, less 2½% carriage paid for 2-ton lots.

MAGNESITE.—**SCOTLAND:** Ground calcined, £9 per ton, ex store.

MAGNESIUM CHLORIDE.—**SCOTLAND:** £7 10s. per ton.

MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf.

MERCURY.—Ammoniated B.P. (white precip.), lump, 5s. 11d. per lb.; powder B.P., 6s. 1d.; bichloride B.P. (corros. sub.) 5s. 2d.; powder B.P. 4s. 10d.; chloride B.P. (calomel), 5s. 11d.; red oxide cryst. (red precip.), 7s.; levig. 6s. 6d.; yellow oxide B.P. 6s. 4d.; persulphate white B.P.C., 6s. 1d.; sulphide black (hyd. sulph. cum sulph. 50%), 6s. For quantities under 112 lb., 1d. extra.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. **SCOTLAND:** Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NITRIC ACID.—80° Tw. spot, £16 10s. per ton makers' works.

OXALIC ACID.—£48 15s. to £57 10s. per ton, according to packages and position. **GLASGOW:** £2 9s. per cwt. in casks. **MANCHESTER:** £49 to £54 per ton ex store.

PARAFFIN WAX.—**SCOTLAND:** 3½d. per lb.

POTASH CAUSTIC.—Solid, £35 5s. to £36 15s. per ton for 2-ton lots ex store; broken, £42 per ton. **MANCHESTER:** £39.

POTASSIUM CHLORATE.—£36 7s. 6d. per ton. **GLASGOW:** 4½d. per lb. **MANCHESTER:** £38 per ton.

POTASSIUM DICHROMATE.—**SCOTLAND:** 5d. per lb., net, carriage paid.

POTASSIUM IODIDE.—B.P. 5s. 6d. per lb. in 7 lb. lots.

POTASSIUM NITRATE.—Small granular crystals, £24 to £27 per ton ex store, according to quantity. **GLASGOW:** Refined granulated, £29 per ton c.i.f. **U.K.** ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—**LONDON:** 9½d. per lb. **SCOTLAND:** B.P. Crystals, 9½d. **MANCHESTER:** B.P. 10½d. to 1s.

POTASSIUM PRUSSIAN.—6½d. per lb. **SCOTLAND:** 7d. net, in casks, ex store. **MANCHESTER:** Yellow, 6½d.

SALAMMONIAC.—Dog-tooth crystals, £36 per ton, fine white crystals, £16 10s. per ton, in casks, ex store. **GLASGOW:** Large crystals, in casks, £37 10s.

SALT CAKE.—Urground, spot, £3 to £3 10s. per ton.

SODA ASH.—58% spot, £5 17s. 6d. per ton f.o.r. in bags.

SODA CAUSTIC.—Solid, 76/77° spot, £12 10s. per ton d/d station. **SCOTLAND:** Powdered 98/99%, £18 10s. in drums, £19 5s. in casks, Solid 76/77° £15 12s. 6d. in drums; 70/73%, £15 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts, 10s. per ton less.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£18 per ton carriage paid North. **GLASGOW:** £17 15s. per ton net ex store.

SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags. **GLASGOW:** £13 5s. per ton in 1 cwt. kegs, £11 5s. per ton in 2-cwt. bags. **MANCHESTER:** £10 10s.

SODIUM BISULPHITE POWDER.—60/62%, £20 per ton d/d 1 cwt. iron drums for home trade.

SODIUM CARBONATE MONOHYDRATE.—£15 5s. per ton d/d in minimum ton lots in 2 cwt. free bags.
SODIUM CHLORATE.—£26 10s. to £30 per ton. GLASGOW: £1 10s. per cwt., minimum 3 cwt. lots.
SODIUM CHROMATE.—4d. per lb. d/d U.K.
SODIUM DICHROMATE.—Crystals cake and powder 4d. per lb. net d/d U.K. discount 5%. MANCHESTER: 4d. per lb. GLASGOW: 4d., net, carriage paid.
SODIUM HYPOSULPHITE.—Pea crystals, £14 10s. per ton for 2-ton lots; commercial, £11 5s. per ton. MANCHESTER: Commercial, £11; photographic, £15 10s.
SODIUM METASILICATE.—£14 5s. per ton, d/d U.K. in cwt. bags.
SODIUM NITRATE.—Refined, £8 per ton for 6-ton lots d/d.
SODIUM NITRITE.—£18 5s. per ton for ton lots.
SODIUM PERBORATE.—10%, 9½d. per lb. d/d in 1-cwt. drums.
SODIUM PHOSPHATE.—Di-sodium, £12 per ton delivered for ton lots. Tri-sodium, £15 to £16 per ton delivered per ton lots.
SODIUM PRUSSIAN.—d. per lb. for ton lots. GLASGOW: 5d. to 5½d. ex store. MANCHESTER: 4d. to 4½d.
SODIUM SILICATE.—£9 10s. per ton.
SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.
SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 12s. 6d.
SODIUM SULPHIDE.—Solid 60/62%, Spot, £11 5s. per ton d/d in drums; crystals 30/32%, £8 15s. per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8 10s.
SODIUM SULPHITE.—Pea crystals, spot, £13 10s. per ton d/d station of 5 cwt. and upwards. MANCHESTER: 1s. 1½d. per lb.
SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.
SULPHURIC ACID.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.
TARTARIC ACID.—1s. 1½d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 1½d. per lb. GLASGOW: 1s. 1d. per lb.
WHITE SUGAR OF LEAD.—£31 10s. per ton net.
ZINC SULPHATE.—Tech., £12 10s. f.o.r., in 2 cwt. bags.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 7d. to 1s. 2d. per lb., according to quality. Crimson, 1s. 6d. to 1s. 7½d. per lb.
ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.
BARYTES.—£6 to £6 10s. per ton, according to quality.
CADMIUM SULPHIDE.—7s. 8d. to 7s. 11d. per lb.
CARBON BLACK.—4½d. per lb., ex store.
CARBON DISULPHIDE.—£31 to £33 per ton, according to quantity, drums extra.
CARBON TETRACHLORIDE.—£41 to £46 per ton, according to quantity, drums extra.
CHROMIUM OXIDE.—Green, 1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 2d. per lb.
INDIA-RUBBER SUBSTITUTES.—White, 4½d. to 5½d. per lb.; dark 4d. to 4½d. per lb.
LAMP BLACK.—£28 to £30 per ton del., according to quantity. Vegetable black, £35 per ton upwards.
LEAD HYPOSULPHITE.—9d. per lb.
LITHOPONE.—30%, £16 10s. to £17 5s. per ton.
SULPHUR.—£9 to £9 5s. per ton. SULPHUR PRECIP. B.P., £55 to £60 per ton. SULPHUR PRECIP. COMM., £50 to £55 per ton.
SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quantity.
VERMILION.—Pale, or deep, 5s. 3d. per lb., 1-cwt. lots.
ZINC SULPHIDE.—£58 to £60 per ton in casks ex store, smaller quantities up to 1s. per lb.

Nitrogen Fertilisers

AMMONIUM SULPHATE.—The following prices have been announced for neutral quality basis 20.6% nitrogen, in 6-ton lots delivered farmer's nearest station up to June 30, 1938: November, £7 8s.; December, £7 9s. 6d.; January, 1938, £7 11s.; February, £7 12s. 6d.; March/June, £7 14s.
CALCIUM CYANAMIDE.—The following prices are for delivery in 5-ton lots, carriage paid to any railway station in Great Britain up to June 30, 1938: November, £7 10s.; December, £7 11s. 3d.; January, 1938, £7 12s. 6d.; February, £7 13s. 9d.; March, £7 15s.; April/June, £7 16s. 3d.
NITRO CHALK.—£7 10s. 6d. per ton up to June 30, 1938.
SODIUM NITRATE.—£8 per ton for delivery up to June 30, 1938.
CONCENTRATED COMPLETE FERTILISERS.—£11 4s. to £11 13s. per ton in 6-ton lots to farmer's nearest station.
AMMONIUM PHOSPHATE FERTILISERS.—£10 19s. 6d. to £14 16s. 6d. per ton in 6-ton lots to farmer's nearest station.

Coal Tar Products

BENZOL.—At works, crude, 9½d. to 10d. per gal.; standard motor, 1s. 3d. to 1s. 3½d.; 90%, 1s. 4d. to 1s. 4½d.; pure, 1s. 8d. to 1s. 8½d. GLASGOW: Crude, 10d. to 10½d. per gal.; motor, 1s. 4d. to 1s. 4½d.
CARBOLIC ACID.—Crystals, 7½d. to 8½d. per lb., small quantities would be dearer; Crude, 60's, 4s. to 4s. 3d., dehydrated, 4s. 6d. to 4s. 9d. per gal. MANCHESTER: Crystals, 9½d. to 10d. per lb. f.o.b. in drums; crude, 4s. 3d. per gal. GLASGOW: Crude, 60's, 4s. 3d. to 4s. 6d. per gal.; distilled, 60's.

CREOSOTE.—Home trade, 6½d. to 6¾d. per gal., f.o.r. makers' works; exports, 6¾d. to 6¾d. per gal., according to grade. MANCHESTER: 5½d. to 6½d. GLASGOW: B.S.I. Specification, 6d. to 6½d. per gal.; washed oil, 5d. to 5½d.; lower sp. gr. oils, 5½d. to 6½d.
CRESYLIC ACID.—97/99%, 4s. 1d. to 4s. 3d.; 99/100%, 4s. 6d. to 5s. per gal., according to specification; Pale, 99/100%, 4s. 6d.; Dark, 95%, 3s. 9d. to 4s. per gal. GLASGOW: Pale, 99/100%, 5s. to 5s. 6d. per gal.; pale, 97/99%, 4s. 6d. to 4s. 10d., dark, 97/99%, 4s. 3d. to 4s. 6d.; high boiling acids, 2s. to 2s. 6d. American specification, 4s. 3d. to 4s. 6d. MANCHESTER: Pale, 99/100%, 4s. 5d.
NAPHTHA.—Solvent, 90/160, 1s. 6½d. to 1s. 7½d. per gal.; solvent, 95/160%, 1s. 7d. to 1s. 8d., naked at works; heavy 90/190%, 1s. 1½d. to 1s. 3d. per gal., naked at works, according to quantity. GLASGOW: Crude, 6½d. to 7½d. per gal.; 90%, 160, 1s. 5d. to 1s. 6d., 90%, 190, 1s. 1d. to 1s. 3d.
NAPHTHALENE.—Crude, whizzed or hot pressed, £8 10s. to £9 10s. per ton; purified crystals, £18 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £5 10s. to £7 per ton. GLASGOW: Fire lighter, crude, £6 to £7 per ton (bags free). MANCHESTER: Refined, £19 per ton f.o.b.
PITCH.—Medium, soft, 38s. per ton, f.o.b. MANCHESTER: 36s. 6d. f.o.b., East Coast. GLASGOW: f.o.b. Glasgow, 35s. to 37s. per ton; in bulk for home trade, 35s.
PYRIDINE.—90/140%, 12s. to 14s. per gal.; 90/160%, 11s. to 12s. per gal.; 90/180%, 3s. to 3s. 6d. per gal. f.o.b. GLASGOW: 90% 140, 10s. to 12s. per gal.; 90% 160, 9s. to 10s.; 90% 180, 2s. 6d. to 3s. MANCHESTER: 12s. 6d. to 13s. 6d. per gal.
TOLUOL.—90%, 1s. 11d. per gal.; pure, 2s. 4d. to 2s. 5d. GLASGOW: 90%, 120, 1s. 10d. to 2s. 1d. per gal.
XYLOL.—Commercial, 2s. 3d. per gal.; pure, 2s. 5d. GLASGOW: Commercial, 2s. to 2s. 1d. per gal.

Wood Distillation Products

CALCIUM ACETATE.—Brown, £8 to £8 10s. per ton; grey, £10 10s. to £11 10s. Liquor, brown, 30° Tw., 6d. to 8d. per gal. MANCHESTER: Brown, £9 10s.; grey, £11 10s.
METHYL ACETONE.—40-50%, £42 to £45 per ton.
WOOD CREOSOTE.—Unrefined 6d. to 9d. per gal., according to boiling range.
WOOD, NAPHTHA, MISCIBLE.—2s. 8d. to 3s. 3d. per gal.; solvent, 3s. 6d. to 3s. 9d. per gal.
WOOD TAR.—£3 to £8 per ton, according to quality.

Intermediates and Dyes

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZIDINE, HCl.—2s. 5d. per lb., 100% as base, in casks.
BENZOIC ACID, 1914 B.P. (ex toluol).—1s. 9½d. per lb. d/d buyer's works.
m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.
o-CRESOL 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.
p-CRESOL, 34-5° C.—1s. 7d. to 1s. 8d. per lb. in ton lots.
DICHLORANILINE.—1s. 11½d. to 2s. 3d. per lb.
DIMETHYLANILINE.—Spot, 1s. 6d. per lb., package extra.
DINITROBENZENE.—7½d. per lb.
DINITROCHLOROBENZENE, SOLID.—£72 per ton.
DINITROTOLUENE.—48/50° C., 8½d. per lb.; 66/68° C., 10d.
DIPHENYLAMINE.—Spot, 2s. per lb., d/d buyer's works.
GAMMA ACID.—Spot, 4s. per lb. 100% d/d buyer's works.
H ACID.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.
NAPHTHIONIC ACID.—1s. 8d. per lb.
α-NAPHTHOL.—Spot, 2s. 4d. per lb., d/d buyer's works.
β-NAPHTHOL.—9½d. to 9½d. per lb.; flake, 9½d. to 9½d.
α-NAPHTHYLAMINE.—Lumps, 1s. per lb.; ground, 1s. 0½d. in casks.
β-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb., d/d buyer's works.
NEVILLE AND WINTHER'S ACID.—Spot, 3s. per lb. 100%.
o-NITRANILINE.—3s. 11d. per lb.
m-NITRANILINE.—Spot, 2s. 7d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 8d. to 2s. 1d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra. 1-ton lots d/d buyer's works.
NITRONAPHTHALENE.—9½d. to 10d. per lb.; P.G., 1s. 0½d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 9d. per lb., 100% d/d buyer's works.
SULPHANILIC ACID.—Spot, 8d. per lb. 100%, d/d buyer's works.
o-TOLUIDINE.—10½d. per lb., in 8/10-cwt. drums, drums extra.
p-TOLUIDINE.—1s. 10½d. per lb., in casks.
m-XYLIDINE ACETATE.—4s. 3d. per lb., 100%.

Latest Oil Prices

LONDON, Nov. 17.—LINSEED OIL was firm. Spot, £29 10s. per ton (small quantities); Dec., £26 17s. 6d.; Jan.-April, £27 2s. 6d.; May-Aug., and Sept.-Dec., £27 5s., naked. SOYA BEAN OIL was steady. Oriental, spot, ex tank Rotterdam, £20 5s. per ton. RAPE OIL was quiet. Crude extracted, £26 10s. per ton; technical refined, £37 10s.; naked, ex wharf. COTTON OIL was dull. Egyptian crude, £19 10s. per ton; refined common edible, £23 10s.; deodorised, £25 10s.; naked, ex mill (small lots £1 10s. extra). TURPENTINE was quiet. American, spot, 31s. per cwt.; Dec. delivery, 31s.; Jan.-April, 32s. 3d.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Bankruptcy Proceedings

CYRIL CLAUDE WOOD, "Sharuhon," Honiton Road, Exeter, acid manufacturer, lately carrying on business at Preston Street, Exeter.—Application for discharge was heard at the Castle, Exeter, on November 12. The receiving order had been made in 1932. The Official Receiver said that the gross liabilities amounted to £844, and a dividend of 3d. in the £ had been declared. Debtor was at present assisting in a petrol-filling station, but was anxious to recommence trading on his own account. The discharge was granted subject to three months' suspension.

Mortgages and Charges

(NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

ASCOTTS PHARMACIES (1933), LTD., London, E.C. (M., 20/11/37.) Nov. 4, Land Registry charge, to Westminster Bank, Ltd., securing all moneys due or to become due to the Bank; charged on warehouse in Beresford Avenue, Wembley. *£4,684. Jan. 1, 1937.

LAMINOID PRODUCTS, LTD., London, W.C., dealers in asbestos, etc. (M., 20/11/37.) Nov. 5, £500 and any further advances debentures, to C. Crisp, London; general charge. *£2,368. Dec. 31, 1936.

Company News

Power-Gas Corporation, Ltd., is raising the dividend for the year to end-September last on its £300,000 capital by 2 per cent., to 8 per cent., less tax. Last year's dividend of 6 per cent. compared with 5 per cent. for 1934-35 and 4 per cent. for 1933-34.

William Briggs & Sons, chemical manufacturers, announce a final dividend of 7½ per cent., making 12½ per cent., on the ordinary shares for the year to September 30. For the period of 10½ months to September 30, 1936, 10 per cent. per annum was paid.

Titanine, Ltd., manufacturers of aircraft "dope" and industrial lacquers, announce an interim dividend of 10 per cent., less tax, against 7½ per cent. The interim last year was followed by a final of 10 per cent., making 17½ per cent. for the initial period of 14 months to March 31 last.

British Industrial Plastics, Ltd., makers of moulding powders, etc., for the year ended September 30 shows gross profit of £105,569 (£80,485); after providing for £22,558 for depreciation, obsolescence, and taxation reserve, net profits are £31,098, consolidated account shows £27,825 provided in all for these purposes; dividend of 8 per cent., less tax (same); £4,173 forward (£2,807).

Dorman, Long and Co., Ltd., according to their preliminary statement for the year ended September 30 last, show that the balance of profit has risen from £1,108,258 to £1,375,418, and, in addition to the dividends on 6½ per cent. first preference and 8 per cent. second preference shares, the directors recommend 18 per cent. on the preferred ordinary and 10 per cent. on ordinary shares, all less tax, payable on January 1, 1938. The 672,167 new ordinary shares issue in December last are entitled to this dividend.

Tate & Lyle, Ltd., sugar importers and refiners, is maintaining its ordinary dividend for the year to September 30 last at 18½ per cent., less tax, with a final of 14 per cent. A transfer of £300,000 is made to general reserve, compared with £284,000 a year ago, when £316,000 was also transferred direct from investment reserve to general reserve. The carry-forward is reduced by £12,647 to £46,227. From the figures announced, it would appear that net profits have risen very slightly from £1,226,840 to £1,227,553.

Unilever, Ltd., and **Univer N.V.** have increased the interim dividends on their ordinary shares in respect of the year ending December 31 next. The dividend in the case of the English company is 4 per cent. on each £1 of stock, and in the case of the Dutch company 30fl. on every share of 1,000fl., which is equivalent to 3 per cent. The corresponding payments for 1936 were 3½ per cent. and 25fl. per share, or 2½ per cent., respectively. The total distribution paid by the English company for 1936 was raised from 6½ per cent. to 7½ per cent., with a final of 4 per cent., and the Dutch company paid 1½ per cent. more at 5½ per cent., the final dividend being at the rate of 3 per cent. The interim dividends are payable on December 1 next, and on the same day both companies will pay dividends for the seven months to end-December on their preference capital.

Chilean Nitrate & Iodine Sales Corporation announce that the half-yearly interest payment on the 5 per cent. sterling income debentures will be made on December 31 at full rate of 2½ per cent.

Tennamaram Palm Oil announce a final dividend of 4 per cent., less tax, making 7 per cent. (nil), for year ended June 30, 1937, to ordinary and preference shareholders on register at close of business November 22.

British Plaster Board, Ltd., has maintained its interim dividend on the £752,323 ordinary capital at 20 per cent. actual, less tax, payable on December 15 to shareholders registered at the close of business on November 17. Last year's interim was followed by a final of 30 per cent., making 50 per cent., less tax.

Forthcoming Events

London.

November 24.—Institute of Chemistry (London and South-Eastern Counties' Section), at Palace Hotel, Bloomsbury Street, W.C. Annual general meeting and smoking concert.

November 25.—Institute of Fuel, at the Meeting Room of the Junior Institution of Engineers, 39 Victoria Street, S.W.1, at 6 p.m. Symposium dealing with "The Ignition of Fuel on Grates." Institution of Chemical Engineers, at the Waldorf Hotel, Aldwych, W.C.2, at 8.30 p.m. President's reception.

Oil and Colour Chemists Association, in the Council Room of the Federation of British Industries, 21 Tothill Street, S.W.1, at 7.30 p.m. L. O. Kelwick and A. Pass, "Acicular Zinc Oxide."

November 30.—Institution of Chemical Engineers, in the Rooms of the Geological Society, Burlington House, Piccadilly, W.1, at 6 p.m. Professor H. Freundlich, "Industrial Applications of Supersonic Vibrations."

Institution of the Rubber Industry, in the Assembly Hall, Royal Empire Society, Northumberland Avenue, W.C.1, at 7.30 p.m. Film on "Rubber—Malaya" commentary by J. S. Ferguson.

December 1.—Society of Public Analysts and Other Analytical Chemists, at Burlington House, Piccadilly, W.1, at 8 p.m. Ordinary Meeting.

Leeds.

November 25.—Chemical Society, in the Lecture Theatre of the New Chemistry Building of the University, at 7.30 p.m. Professor J. M. Gulland, "Enzymes as Chemical Tools."

Birmingham.

November 26.—Society of Chemical Industry (Birmingham and Midland Section), at the James Watt Institute, at 8 p.m. F. Sprouton, Jubilee Lecture, "The Rise of the Plastics Industry."

November 27.—British Association of Chemists, at the Queen's Hotel, at 3 p.m. Twentieth annual general meeting. Annual dinner at the Queen's Hotel, at 7 p.m.

November 29.—Birmingham University Chemical Society, in the Chemical Lecture Theatre of the University, Edgbaston, at 5 p.m. Dr. G. S. Hanes, "The Action of Amylases in Relation to the Problem of the Molecular Constitution of Starch."

November 30.—Institute of the Plastics Industry (Midlands Section), at the James Watt Memorial Institute, at 8 p.m. E. Marsden, "Plastics in Telephone Engineering."

Newcastle.

November 26.—Bedson Club, in the Chemistry Lecture Theatre of King's College, 6.30 p.m. Professor J. R. Partington, "Chemistry in the Ancient World."

Glasgow.

November 26.—British Association of Chemists, at Mackays Hotel, Glassford Street. J. Kirkwood, "Rubber Manufacture."

Belfast.

November 27.—Institute of Chemistry (Belfast and District Section), at Grand Central Hotel. Annual dinner.

Hull.

November 29.—Hull Chemical and Engineering Society, at the Lecture Room, Municipal Technical College, Park Street, at 7.45 p.m. F. A. Williams, "Hydrogenation, with Special Reference to the Products Obtainable."

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

South Africa.—H.M. Senior Trade Commissioner in South Africa reports that the Cape Town Municipality is calling for tenders, to be presented in Cape Town by December 22, 1937, for the supply of filtration plant, etc., required for a sea-water swimming bath. (Ref. T.Y. 28290/37.)

Argentina.—An agent established in Buenos Aires wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers of the pigments and other raw materials for paint, and painters' sundries. (Ref. No. 338.)

